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AGRICULTURE

No. 1307

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LIVESTOCK FEED PROCUREMENT

ESTONIAN AGRICULTURAL MINISTRY STRESSES LIVESTOCK FEED PRODUCTION

Tallinn RAHVA HAAL in Estonian 29 Aug 81 p 1

[Article by Rafael Tuisk, deputy director of the Cattleraising Administration of the Estonian Ministry of Agriculture: "Particular Attention to Livestock Feeding"]

[Text] Experiments conducted at the Vandra livestock experimental station have shown that tilled pastures provided only 12 percent of the summer harvest in September. To meet the needs of dairy herds, however, 20 percent of the entire summer harvest is needed in September. So if in June there is half again as much fodder on the pastures as needed, and in July one quarter as much, then there will be a 40 percent shortfall in September, and the herds will have to be fed with other feeds.

But microorganisms also play an important part in livestock digestion. As Professor U. Oll has stated, "micoorganisms are able to adapt to various rations, but they often require a lengthy period to accomplish this. Therefore radical changes in diet should be avoided; new feeds are to be introduced gradually in stages." This is the reason that changes should be begun in September--in the last ten days of September or early in October the herds should be kept in stables and introduced to winter feed.

In the fall the quality of pasture grass deteriorates. The departments of pasture cultivation and livestock feeding of the EPA [Estonian Agricultural Academy] investigated changes in the nutrient content of grasses in the course of a feeding season at the Karkna department of Sootaga Sovkhoz.

It was shown that during the first feeding cycle, the grass contained the most moisture; during the second and the last feeding cycles, the solid matter content of grass tended to be small. Analysis showed that pasture grass seldom contains too little raw fiber (less than 20 percent of the solid grass components). The grass usually tends to overage and contains 27-28 percent raw fiber in the solid matter. Results of the experiment showed that grass grown in the last two feeding cycles has below-average nutritional value. This fact also requires that feed rations be changed at the beginning of September; the need for this is proven by the experiences of the best dairy herders. Green fodder from the meadows in August is supplemented in the harvest season by chaff; later the animals have to be fed hay.

After grass has been exhausted on both meadows, the animals should receive other green fodder. During the preparation of corn silage (i.e. the first half of September) the animals are also fed green corn. Then comes the turn for other high-moisture feeds (roots, feed cabbage, low-value vegetables, etc.).

If the animals were fed meager rations of feed concentrate, the proportion of feed concentrate should now be increased. At first the summer-time low-protein feed concentrate will do fine, but as winter feeds (roughage, dry silage and silage) increase in the rations, it is advisable to begin feeding the herds high-protein mixed concentrate.

This is the way things are done in a normal year. But the weather can impose changes. In recent times the weathergods have not been kind to milk production. Too much precipitation softens the pasture and prevents harvesting additional green fodder and interferes with its transport. Therefore, at times the proportion of winter-time feeds in feed rations should be increased earlier than usual. When and how this should be done is difficult to fix exactly; the entire feeding scheme should avoid sudden drops in production. Of course, feed collected for the winter must not be expended--pasture grass and new growth must be used as much as possible to conserve winter feedstocks. The task is not an easy one, but it has to be solved correctly in each collective, so that there can be successful milk production in September and the early winter months, and so that the 1981 plans for milk production and marketing can be met.

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LIVESTOCK FEED PROCUREMENT

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IMPORTANCE OF FURTHER DEVELOPMENT OF FEED PRODUCTION DISCUSSED

Moscow VESTNIK SEL'SKOKHOZYAYSTVENNOY NAUKI in Russian No 8, Aug 81 (received 19 May 81) pp 95-105

/Article by K. M. Solntsev, academician of the All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin: "Feed Is a Lever of the Rise of Animal Husbandry"/

/Text/ The development of domestic animal husbandry is characterized by a constant growth of output on the basis of the strengthening of the material and technical equipment of farms, increase in the population of livestock and poultry and in their productivity and improvement in the organization and technology of production. The average annual gross output of milk totaled 92.6 million tons during the 10th Five-Year plan, as compared to 87.5 million tons in 1971-1975, and of all types of meat, 14.9 and 14 million tons during the same period. The production of eggs increased by 22.8 percent and of wool, by 4.1 percent. During the past 5-year period the growth of gross output was attained mainly through an increase in the population. The herd of cattle increased by 9.3 million head, including of cows, by 2.2 million. The hog and sheep population also increased. A total of 2,215 kg of milk per cow were obtained in 1979. This was only 11 kg more than in 1975. The live weight of a head of cattle sold to the state increased from 332 to 361 kg and of hogs, from 91 to 102 kg.

The characteristic feature of modern agricultural production lies in the high rates of technical progress--increase in the power-worker ratio and labor productivity growth. During the preceding 5-year period labor productivity in the sector increased by 15 percent. Significant work is done on the transfer of animal husbandry to an industrial basis and on the construction of complexes and large farms with flow production.

An increase in the production of livestock products is inseparably connected with the intensification of feed production, establishment of its high-grade base and increase in the quality of herd and in the productivity of animals. There is no need to demonstrate that even the most advanced technology does not ensure profitable highly efficient production without a high-grade feeding of animals and an efficient utilization of feed resources.

Throughout five-year plans the production of all types of feed increased and will continue to do so. A total of 62 percent more feed was produced in 1976-1979 than in 1962-1965 and its volume is to be increased by 23 percent in 1985 as compared with 1979.

However, the problems of a balanced development of the feed base and increase in the quality of feed and in the efficiency of utilization of its resources require maximum attention and new approaches. At the 26th CPSU Congress the report by Comrade L. I. Brezhnev, general secretary of the CPSU Central Committee, the report by Comrade N. A. Tikhonov, chairman of the USSR Council of Ministers, and Basic Directions in the Economic and Social Development of the National Economy of the USSR for 1981-1985 and for the Period Until 1990 paid a great deal of attention to the exceptional significance of an efficient and rational utilization of feed in an increase in meat and milk production.

During the last 3 five-year plans the production of all types of feed did not increase uniformly. The average annual production of concentrated feed increased by 265 percent in 1976-1979, as compared with 1962-1965, of succulent feed, by 56 percent and of coarse feed, by 77 percent.

The increase in the proportion of concentrates in the feed structure reflects the processes of intensification of animal husbandry, rise in energy in the dry substance of rations and active development of industrial poultry and hog breeding based mainly on concentrated feed.

However, not all the changes in the feed structure are of a positive nature. This especially applies to the feeding of cows and to the breeding and fattening of large-horned cattle. With a total increase of 25.8 percent in the consumption of feed per cow during these years the proportion of concentrates in rations did not increase uniformly--2.2-fold--rising from 200 to 400 grams per kg of milk, and the proportion of pasture feed in summer rations decreased by 23 percent.

The same inefficient utilization of concentrates exists in beef production. While the total unjustified increase in expenditures was from 11.8 to 13.1 fodder units per kg of gain in live weight, the expenditure of concentrated feed increased from 1.4 to 3.5 kg. Here it can be seen with special clarity that an increase in the proportion of concentrates did not improve, but lowered, the efficiency of their utilization.

Long-term investigations by scientists at the All-Union Institute of Animal Husbandry and other scientific centers indicate that, when kept on pastures with a grass stand satisfactory in its productivity, no more than 100 grams of concentrates per kg of milk are fully sufficient for cows with a daily milk yield of 8 to 10 kg and it is not at all recommended to introduce concentrated feed on good pastures, where animals together with green creep feed eat 50 to 55 kg of grass.

Thus, an insufficient utilization of summer green and, especially, pasture feed does great economic damage. Pasture grass, in particular from cultivated pastures, always was and remains the cheapest and biologically most valuable feed and its proportion should not be reduced.

The structural composition of coarse feed has deteriorated. Hay, whose amount also previously was below the norm, was reduced by 36 percent in the structure of rations. The level of hay in the country's feed balance should be restored. A total of 1 ton of hay per cow without an "excess baggage"--this is the minimum from which we must not deviate.

A decrease in the proportion of succulent feed in rations does not correspond to the task of increase in productivity, especially of dairy cattle. Therefore, the elaboration of an overall program for a balanced development of the feed base should fully reflect a rational system for the utilization of all fodder land and all traditional and nontraditional resources. It is very important to pursue a firm course for a more active inclusion of green summer feed and coarse and succulent feed in the rations of large-horned cattle and sheep, combining this with a sound concentrate saving measure.

A rational utilization of feed resources is organically connected with the quality of hay, haylage, silage, grass meal, fodder straw, green summer creep feed, pastures and concentrated feed available at kolkhoz and sovkhoz departments. A unified state service for the control of feed quality was established in the country in 1977. It services all kolkhozes, interfarm enterprises and sovkhozes engaged in feed production. The quality of hay, haylage, silage and grass meal is now mandatorily analyzed according to a single standard method. In the country there are many farms, which annually fully provide their animal husbandry with various feed. However, the productivity of animals by no means rises on all these farms. It often remains low. What is the reason for this? The significant proportion of poor-quality feed allocated for animals. In 1978-1980 the hay, haylage and silage of the first- and second-quality category received by large-horned cattle and sheep comprised no more than one-half of the total volume of this feed. Therefore, one-half of the feed utilized in rations was of a sharply lower quality. The vast losses due to the poor quality of feed have a very severe effect on the fulfillment of the plans for an increase in the productivity of animal husbandry, on herd reproduction and on the preservation of young stock. This has become a serious hindrance to the growth of the production of livestock products. Annual losses due to a deterioration in the quality of feed are estimated at approximately 2.9 to 3 billion rubles.

Preserving feed in feed storage facilities, where it is possible to reliably maintain technological conditions for the production of high-category feed and for its prolonged storage without losses, is one of the efficient measures of controlling losses and retaining a high quality of feed. However, many farms manifest sluggishness, which is difficult to understand, in the construction of good capital feed storage facilities. If the construction of storage facilities continues at the same rates at which they are built now, many years will be needed for the creation of optimal conditions for the storage of the produced volume of hay, haylage and silage. Of course, this is not acceptable for a rapid and sharp improvement in the quality of feed. It is appropriate to compare two figures. For a full provision of feed with storage facilities it is necessary to spend approximately 6.4 billion rubles, while the annual damage from the spoilage of feed due to the lack of such capacities amounts to 2.9 or 3.0 billion rubles. Therefore, in 2 years the capital investments in construction will be repaid with good feed and an additional quantity of milk and meat.

Among the many scientific institutions for agriculture not a single institute in the system of the USSR Ministry of Agriculture and the All-Union Order of Lenin Academy of Agricultural Sciences imeni V. I. Lenin conducts in-depth investigations on improving existing and designing new capacities for feed storage. Even at the All-Union Institute of Fodder no laboratory is engaged in this problem. Therefore, it is not accidental that the country's vast fodder shop, whose annual turnover contains about 300 million tons of haylage and silage, has nothing but trenches for their storage. The attempt to adopt the structures of towers for feed has ended with the fact that now they are idle and stand like memorials to the big funds invested in their construction.

Storage in clamps, mounds and earth pits leads to vast losses and a low quality of feed. Only one type of storage facility--a trench of a capacity of 1,000 to 10,000 tons--is recommended for haylage and silage in all zones and regions. However, life has shown that any trench is a vast water collecting area, which cannot protect feed from the washing and flushing of nutrients, especially in water-logged zones. The filling of trenches with raw materials with the arrival of transport there is connected with a considerable pollution of haylage and silage with earth.

The problems of improving storage facilities for hay are no less acute. Everything that we build--hay sheds, barns, lofts and mows--all this was transmitted to us from the peasants' "building" experience. Where are modern technical solutions?

In our opinion, it is necessary to energetically correct this very important link in the feed conveyer. The feed shop of animal husbandry needs modern mechanized inexpensive storage facilities for hay, silage, haylage, straw and other feed, which guarantee a long storage of high-quality feed without losses.

Our modest experiment attests to the possibility of developing such storage facilities with negligible losses of silage and haylage. On the Dubrovitsa Experimental Farm of the All-Union Institute of Animal Husbandry we built two precast reinforced concrete trenches, each of which had a capacity of about 1,000 tons of haylage. A light slate roof was built over them. There was hardly any spoilage and waste of haylage in these storage facilities, whereas in trenches without covers the layer of spoiled feed reaches 15 to 20 cm.

Conditions for a long-term storage of haylage and silage, preservation of their high quality and only negligible losses of nutrients are created in trenches with roofs. In such capacities it is possible to accumulate reliable insurance reserves of feed. Our experiment in 2-year storage of silage and haylage in small experimental storage facilities showed that the losses of the dry substance in silage made up 12.4 percent and, with the addition of a chemical preservative, 6.4 to 8.0 percent. In haylage losses were even lower.

The provision of storage facilities with stationary instruments for the control of feed quality in capacities is of great importance. In this case production has a big claim against the Agropribor Firm, which for many years has avoided the development and production of special instruments for such a purpose.

The evaluation of the quality of hay, haylage and silage according to the category system is not connected with the evaluation of their general nutritiousness and content of digestible protein. Standards of nutritiousness, which correspond approximately to the nutritiousness of first-category hay, haylage and silage, are used for calculations of the provision of animal husbandry with feed. This involuntarily leads to an increase in the nutritiousness of all procured feed to the level of the first category, which cannot be considered correct. For example, the standard of nutritiousness of 1 kg of hay is accepted at 0.47 fodder units. According to the data of the All-Union Institute of Animal Husbandry, the nutritiousness of first-category hay is also 0.47 fodder units, but the nutritiousness of second-category hay, 0.42, third-category hay, 0.36 and noncategory hay, only 0.28. In 1 kg of first-quality category haylage there are 0.35 fodder units and of third-category, only 0.28. Noncategory haylage has only 0.20 fodder units. In 1 kg of first-category silage there are 0.18 fodder units and of third-category, 013. However, noncategory haylage has 0.09 fodder units.

Animals, consuming feed, are capable of creating output only from the nutrients available to them. If a ration corresponds to the adopted norms only in mass, but in nutritiousness contains much less energy and digestible protein than it should, productivity decreases sharply.

Thus, for an objective planning of the production of milk and meat and a correct calculation of feed expenditures on their formation planning bodies and farms should be guided by the actual reserve of nutrients contained in feed, not only by the gross output characterizing its quantitative reserve. How significantly this changes the idea of the fulfillment of the feed production plan can be seen from the following data. Last year the plan for the procurement of haylage in terms of mass, without taking the quantity of nutrients in it into account, was fulfilled 98 percent and with due regard for quality, that is, nutritiousness, only 78.8 percent and for the procurement of silage and hay, 83 and 64.5; 74 and 60.7 percent respectively.

Every feed has a qualitative description. Data on the concentration of nutrients and on their digestibility and availability for use and high-quality indicators are its basic content.

Taking into account the ever greater importance of our knowledge of feed, we decided to give a more definite idea of its quality, which, in our opinion, can serve as a guideline in the evaluation of the situation with feed quality on every farm.

The quality of feed, or the coefficient of quality, is the ratio between the actual and natural nutritiousness of feed. The more effective the methods of preservation maximally retaining organic and mineral substances and the high quality, taste, color, smell and structure (consistency) of feed in a form available for animals, the higher the ratio.

We consider our proposal a formulation, which, naturally, needs to be discussed. The introduction of the concept of coefficient of feed quality makes it possible to have a fuller description of its feed value, because this indicator objectively reflects the high quality and, at the same time, nutritiousness of a given feed resource. If, for example, the coefficient of hay quality is 1 unit, this indicates its very good quality and storage and high nutritiousness. As the quality of hay and its nutritiousness is lowered, the quality coefficient drops and can reach the value 0.6-0.5 and below. Silage placed in the third category on the scale of evaluation has a quality coefficient of 0.72, but, if it is considered noncategory silage, this number decreases to 0.5.

The deterioration in the quality of feed is connected with the loss of its energy value and depreciation of the entire complex of nutrients and physiologically active substances. The number of destroyed organic and mineral substances in such a feed resource increases. When the quality category of procured coarse and succulent feed is determined on the basis of analyses on farms, it will become possible to know and take into account the quality coefficient of feed placed in every hay, haylage and silage storage facility. Subsequently, when preparing rations, farm specialists will take this coefficient into account. For example, on the average, 3 kg of hay, 4 kg of haylage and 8 kg of silage are to be included in a ration per cow. The quality coefficient of this feed on the farm is 0.9, 0.8 and 0.8. Therefore, 3.3 kg of hay (3.0:0.9), 5 kg of haylage (4:0.8) and 10 kg of silage (8:0.8) should be included in a ration.

During the five-year plan that has begun the production of meat will have to be increased by 3 million tons and of milk, by 7 million tons annually. For this it will be necessary to increase feed production approximately by 55 million tons of fodder units and by 6 million tons of digestible protein. Attention should be drawn to the fact that the program for the gross increase in the production of feed for a rise in meat and milk production in the prescribed volumes can be realized with the gross quantity of feed now produced by the country's farms, but with a strict fulfillment of only one condition--elimination of feed losses during storage and prevention of a deterioration in its quality and nutritiousness as compared with the natural level. By this comparison we do not at all want to say that it is possible not to work on an increase in feed production. Conversely, during the 11th Five-Year Plan a great deal will have to be done for an outstripping development of the feed base and its all-around balancing. However, the presented calculation shows the scale that the problem of feed quality has reached and the great attention that it should attract.

One cannot mention only one reason. There is a whole set of them, owing to which every year farms receive a large flow of poor-quality hay, haylage, silage, grass meal and straw. At the same time, farm managers and specialists, in an attempt to fulfill the plans for meat and milk production, raise the productivity of animals under such conditions by feeding them high and very high norms of concentrated feed. Unfortunately, for some specialists this has become a rule, to which they have become so accustomed that they do not imagine how it is possible to work differently. However, the annually high proportion of concentrates in rations, poor-quality coarse and succulent feed, lack of balance in basic nutrients and deviation from scientifically substantiated recommendations for types and norms of feeding--all this causes a disturbance in metabolism in animals, especially in milking cows, and profound irreversible pathological changes in the organism. With short-term rises of the lactation curve high rates of concentrates do not lead to an increase in milk productivity. That is why the fight for an improvement in the quality of coarse and succulent feed is the most effective measure in an improvement in the utilization of all the feed resources of animal husbandry, especially concentrates.

Basic Directions in the Economic and Social Development of the National Economy of the USSR for 1981-1985 and for the Period Until 1990, among the urgent tasks of a fundamental improvement in feed production, point out clearly: "To improve the quality of all types of feed..." and further: "To accelerate the construction of storage facilities for silage, haylage, hay, grass meal, root crops and other feed according to standard plans on farms."

Chemical feed preservation has acquired the importance of a major state measure. The preparation of high-quality silage and hay from any green feed is the main object of this method. The All-Union Institute of Animal Husbandry together with other scientific institutions completed a certain stage in research, on the basis of which an instruction for the chemical preservation of green feed was proposed. As compared with ordinary silage, every ton of chemically preserved feed additionally contains 30 to 40 fodder units, 5 to 8 kg of protein and 15 to 20 kg of sugar. Chemical preservation lowers nutrient losses to one-half or one-third, as compared with ordinary silaging. A ruble of expenditures on this method of feed procurement yields 3 to 4 rubles of net profit.

During the 11th Five-Year Plan the All-Union Institute of Animal Husbandry and other scientific research institutions will concentrate their attention on improving the technology of chemical preservation and on searching for nonagressive preservatives possessing properties of natural metabolites in animals. The products, as well as waste, of chemical, pulp-paper and microbiological industries should become the main sources of preservatives. The All-Union Institute of Animal Husbandry received priority for such preservatives as chloroform, "edipaty," the "BU" preparation and complex preparations developed on the basis of the waste of caprolactam production and the production of nitrogen fertilizers. The institute embarked on the development of phytoncide (feed is preserved with feed) and ion-electron preservation of green feed and hay of a high moisture.

Unfortunately, the lack of special capacities for storage and transportation, as well as of mechanisms for the introduction of preparations into raw materials, has become a serious obstacle in the realization of large-scale plans for chemical preservation. With an extremely negligible plan for the production of preservatives in 1980 about 6,000 tons of preparations were not removed from bases. The institutes authorized to engage in the technical equipment of preservation embarked on the fulfillment of assignments very late. This is a very serious miscalculation in the planning of scientific research. It is extremely important to work out all the aspects of the problem of improvement in feed quality in an overall manner at the level of the achievements of world science.

In the increase in the efficiency of feed utilization it is difficult to overestimate the importance of mixed feed, which embodies, as it were, the complex of scientific achievements in feeding, standardization and technology. In connection with the sector's industrialization and the keeping of animals in closed barns there is the need to control rations according to a much bigger number of indicators and to take into account the increased need for biologically active substances and the additional need for vitamins as antistress factors.

Modern formulas balance mixed feed according to 30 or 32 indicators of nutritiousness, including 17 to 20 biologically active substances. The development of an improved and effective formula of premixes is one of the urgent directions in zootechnical science. Some new patterns and basic principles of combination of biologically active substances into intricate complexes were determined during the past five-year plan. It was established that not a single mixed feed component manifests itself in the animal organism independently, without connection or interaction with the entire complex of nutrients and chemical compounds (of an organic or inorganic nature) entering with feed or formed in the organism as a result of metabolic processes. Therefore, the full value of animal feeding cannot be appraised only by the number of vitally important substances entering with mixed feed or a ration. The evaluation and, consequently, development of formulas should be made with due regard for the complex relationships that occur in the organism (at the level of the digestive tract and tissue metabolism) among food elements. The theoretical assumption, according to which the nutritive effect of a feed mixture is somewhat different than the effect of the sum of its components, also retains its importance for mixtures of biologically active substances. In connection with this the development of complexes giving a higher productive effect than the sum of actions of individual components becomes the basic principle in the development of formulas of premixes.

Mixed feed for dairy cows and fattening young stock, in which the proportion of grain does not exceed 35 to 53 percent, has been developed on the basis of a careful balancing of mixed feed in nutrients and biologically active substances. With such mixed feed--and this has been demonstrated--it is possible to obtain annual milk yields of 4,000 to 5,000 kg and average daily weight gains of 1,000 to 1,100 grams in fattening young large-horned cattle.

The new formulas of high-grade mixed feed for various sex and age groups of hogs contain 52.5 to 64.0 percent of grain. When they are fed, the live weight of hoglings 106 days old reaches 40 kg and the average daily weight gain in fattening hogs, 600 to 650 grams.

In the light of the tasks set by the 26th CPSU Congress for a more rational and efficient utilization of mixed feed and increase in the scale of its production investigations are directed toward finding new types of nongrain raw materials, new preparations of biologically active substances and methods of using various waste of the processing industry for feed purposes. In connection with this the wide utilization of high-quality grass meal, dry pulp residues, brewery spent grains, wine production waste, canned fruits and vegetables, dry potatoes, whey and buttermilk deserves special attention. The study of the efficiency of the methods of moisture and heat treatment of grain crops, especially pulse crops, and other components for an increase in the palatability, digestibility and assimilation of mixed feed nutrients acquires great importance.

The problem of increasing the efficiency of feed utilization also affects the sphere of selection, where the heightened capacity of animals for an efficient utilization of feed has long been singled out as an important hereditary character. Investigations conducted in our country and abroad have shown that types of animals with hereditarily determined differences in the efficiency of feed utilization exist within every species and breed. For example, the data of a number of investigations conducted on various breeds of large-horned cattle have demonstrated that between its dairy and dairy-meat types there is a difference in the feed to milk and meat conversion coefficient equal to 9.5 percent. It has been established that, when dairy types of animals are used, milk production increases by 11 percent and feed consumption decreases by 16 percent. The All-Union Institute of Animal Husbandry, the All-Union Institute of Beef Cattle Husbandry, the Poltava Institute of Hog Breeding, the Siberian Scientific Research Planning and Design Technological Institute of Animal Husbandry and other institutes work on the development of types and lines of animals capable of producing output with smaller feed expenditures. The direction for the development of the meat type of hog to replace fatty breeds is very promising. One can imagine how economically important it is to have large groups of breeds and pedigree types of animals, which, for example, for the production of 1 million tons of milk will use 900,000 to 950,000 tons of fodder units, not 1,350,000 tons as now, and for 1 million tons of increase in pork, 4.5 million tons of fodder units, not 7.5 million. It is necessary to actively support breeders working in this promising direction.

The effectiveness of metabolic processes forming the basis for feed conversion can be disclosed through the study of individual units of physiological and biochemical mechanisms. The data obtained can be utilized in the selection of livestock for the ability to effectively transform feed into milk, body mass and other livestock products. Undoubtedly, an increase in the effectiveness of feed transformation by animals by means of selection will contribute to a more rational utilization of the feed resources of animal husbandry. As is well known, selection programs for the development of new breeds of farm animals are now being worked out. In connection with this the assignment for the development of a model animal that would use 15 to 20 percent less feed per unit of output than existing breeds should become an obligatory element of these programs.

An optimal amount and ratio of nutrients, especially easily digestible carbohydrates and protein in a ration, is an important condition for a highly efficient utilization of feed and its most valuable part--protein. The investigations of the All-Union Institute of Animal Husbandry have established that in the ration of milking cows the sugar-protein ratio should be within 0.8-1.2:1.

In rations, in which, in addition to hay and haylage, as sources of easily digestible carbohydrates, there are small amounts of root crops, the sugar-protein ratio changes within 0.7-0.8:1, that is, it is at the lower level of the need. In rations without root crops and with low-quality hay and haylage the sugar-protein ratio drops to 0.3-0.4:1, which leads to big unproductive losses of protein and, as a consequence, underproduction of a considerable amount of output. It is very important to stress that with the preservation of a high quality of feed the problem of sugar shortage does not arise. High-quality hay (up to 50 grams of sugar per kg), artificially dried grass (up to 100 grams of sugar per kg), good haylage from grass-legume mixtures (up to 30 grams of sugar per kg) and root crops (54 grams of sugar per kg) should be the main sources of sugar in the rations of cows.

The state of the study of vitamin and mineral feeding of animals is alarming. Investigations of this problem have not been properly developed in the last 10 years. Many data on the need for vitamins and mineral substances contained in handbooks of feeding were obtained 20 to 30 years ago on synthetic and semisynthetic rations. They do not reflect the modern practice of feeding and are not connected with the productivity of animals.

The changes in the technologies of feed procurement and feeding reduced the availability of vitamins and mineral substances and with the transfer of farms to an industrial basis the utilization of these components decreased.

Methods of determining vitamins and trace elements in feed and their availability are not being improved efficiently. There are only two laboratories for this problem in the country--at the All-Union Scientific Research Institute of Physiology and Biochemistry of Farm Animals and the Ukrainian Scientific Research Institute of Physiology and Biochemistry of Farm Animals--and they are not numerous in their composition. Unfortunately, the All-Union Institute of Animal Husbandry also underestimates the importance of this section of zootechnical science.

An increase in the production of livestock products at every department and on every farm should be based on a scientifically substantiated calculation. It must be determined what part of gross production should be ensured through an increase in the herd of animals and what part should be attained through a rise in productivity. This is one of the major and fundamental problems of technical policy actively affecting the efficiency of feed utilization. For this it is necessary to know well the development of the genetic potential of every herd and to actively affect the qualitative improvement in all the elements of the feed base. The animal husbandry of the Uzbek SSR can serve as an interesting example. In this republic from 1965 through 1980 gross milk production increased by 211 percent. The population of cows rose only 28 percent and productivity, 240 percent.

However, there are also many farms where the entire increase in gross milk production is attained only through a rise in the population of cows, but their milk productivity remains low and the genetic potential is realized only 60 to 70 percent. In this case feed expenditures on output are unjustifiably high. An inefficient utilization of both population and feed exists in hog breeding. It is well known that during the past five-year plan the population of hogs increased by 27.6 percent and the production of pork decreased by 5.4 percent.

In the increase in gross output there can be no routine approach to farms even in one rayon, all the more so in an entire oblast or republic. Each farm must keep its own substantiated accounts. Our science somehow has shunned these problems and at times they are solved by workers of planning bodies who are not sufficiently competent in this area. Apparently, it is advisable to have a special methodological recommendation. The All-Union Institute of Animal Husbandry prepared methodological instructions for programming the productivity of farm animals on standard farms. In these instructions it is necessary to intensify the scientific substantiation of the increase in the volume of gross production of milk, beef, pork and mutton as a result of an increase in population and productivity.

To improve the utilization of feed resources, it is necessary to refine the principles of standardization and norms of animal feeding. For example, for a high-grade feeding of cows we should no longer limit ourselves to only six indicators of nutritiousness of rations. The present drafts of norms developed by a group of scientists at many institutes take into account the true need of cows for energy, dry substance, crude and digestible protein, carbohydrates (starch and sugar), crude cellulose, crude fat, trace elements--calcium, phosphorus, potassium, sodium, chlorine, magnesium, sulfur, iron, copper, zinc, coblat, manganese, iodine, selenium and so forth--carotene, vitamins--A, D and E--and in all 30 indicators. Detailing animal feeding norms will make it possible to more efficiently utilize the country's feed resources, to increase the productivity of livestock and feed conversion and to improve the quality of milk, meat and other livestock products. Calculations show that the introduction of detailed feeding norms only for 6 million cows of the black-and-white breed will additionally give 1.4 million tons of milk.

There is a need to review and specify the need for and evaluation of the energy nutritiousness of feed and rations on the basis of modern knowledge of energy metabolism in animals of various species, physiological states, specializations and levels of productivity. The development of a new system of energy feeding of farm animals on the basis of metabolizable energy is being completed.

A rational utilization of feed resources includes such aspects as selection for the development of new varieties of fodder crops, whose dry substance is more fully digested and assimilated by animals; improvement in the keeping of animals, which rules out the formation of additional heat output for maintaining the temperature of the body; use of advanced technologies of feed preparation increasing the utilization of the potential energy of feed; inclusion in rations of biologically active substances stimulating the productivity of animals and lowering the expenditures of feed nutrients on output.

Our zootechnical science is rich. It has a vast arsenal of effective means, methods and systems for an improvement in the utilization of feed resources. It is very important to actively direct all the means of science toward a successful fulfillment of the food program, whose basic tenets were determined in the historical decisions of the 26th CPSU Congress.

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LIVESTOCK FEED PROCUREMENT

VITEBSK AREA USE OF FOOD SCRAPS FOR LIVESTOCK FEED

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 9, Sep 81 pp 36-38

[Article by I. Menzhinskiy, candidate of economic sciences and deputy chairman of the Vitebskaya Oblast Executive Committee: "Proper Organization of the Collection and Efficient Use of Food Scraps"]

[Text] In the "Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and the Period Up To 1990," emphasis is placed upon the urgent task of achieving radical improvements in feed production and in satisfying the feed requirements for public animal husbandry and also for the livestock and poultry being maintained on a private basis by citizens. This program document also sets forth the requirement for making more complete use of all available resources and this includes to a large degree the proper use of food scraps for feeding to the livestock.

Experience has shown that an average of 40-50 kilograms of such scraps can be collected annually per resident. One ton contains 2-2.5 quintals of feed units. It is easy to imagine the tremendous amount of additional feed that can be obtained through the use of feed scraps, for the fattening of hogs, provided a very responsible attitude is displayed towards this work.

In organizing the collection of food scraps, a leading role will be played by workers attached to enterprises and organizations of the housing and municipal economy. These individuals are aware that by collecting food scraps they are at the same time establishing proper sanitary order in the various regions of a city.

The collection of food scraps in Vitebskaya Oblast was begun in 1973, following a study of the experience that had been accumulated by this time in Moscow, Leningrad and a number of other cities. In 1974, a cost accounting oblast office for the procurement of the mentioned scraps was created. It was provided with the required number of motor vehicles and given assistance in equipping them and in preparing appropriate containers. In 1979, in accordance with a recommendation by the Ministry of Housing and Municipal Services for the Belorussian SSR and a decision handed down by the Vitebskaya Oblast Executive Committee, an oblast specialized motor transport and procurement enterprise was organized for the procurement and transporting of unplanned feed -- Oblavtotranszagotkorm. Its table of organization numbers 107 individuals and it has 46 motor vehicles at its disposal. Extensive use is made here of the piece-rate plus bonus wage system.

The enterprise has branches in five cities -- Vitebsk, Orsha, Polotsk, Novopolotsk and Novolukoml'. The work of the enterprise and its branches is organized based upon agreements between the suppliers of the food scraps -- housing administrations, childrens' and medical institutes, public catering enterprises and trade and industrial enterprises on the one hand and the consumers of these scraps -- the kolkhozes and sovkhozes -- on the other.

Each year the executive committee of the oblast soviet of people's deputies establishes the tasks for the collection of food scraps and it determines which farms they are to be delivered to for swine raising purposes.

The centralization of the transport equipment made it possible to eliminate the seasonal nature of food scrap collection, which existed prior to the formation of the procurement office and the Oblavtotranszagotkorm enterprise. At that time, the collection of these scraps was mainly dependent upon the ability of the kolkhozes and sovkhozes to transport them. However, the farms were not always able to perform this work. Today the Oblavtotranszagotkorm enterprise and its branches are systematically transporting these scraps, collected from all enterprises, organizations and from the population in five cities.

The food scraps are collected from the population by yard-keepers, who place collection containers on the staircase landings or in the yards of dwellings and gather them up prior to their being loaded onto motor transport vehicles.

Control over the collection of the food scraps and accounting for the work of the collectors are carried out by housing administration workers and over the transporting of the scraps -- by the procurement organizers and the chiefs of the Oblavtotranszagotkorm branches. The collectors receive wages (from 3.50 to 9.50 rubles per ton) based upon accounting data and depending upon the method employed and the labor-intensiveness involved in collecting the food scraps. The leading workers of housing administrations engaged in organizing the collection of food scraps (managers of dwellings, technician-inspectors and bookkeepers), for the purpose of material interest, are paid 1.60 rubles per ton of scraps collected.

An increase in the material interest of the collectors of the food scraps, the centralization of the motor transport facilities used for transporting them to the farms and efficient organization of this work have promoted an increase in the procurement volumes for such scraps. Compared to the first year for the centralized collection of food scraps in the oblast when 6,000 tons were collected, including 2,000 tons from the population, during 1980 the figures increased to 82,000 and 17,500 tons respectively. The food scrap collection task established for last year was fulfilled by 105 percent. For the oblast as a whole, an average of 52 kilograms was collected per resident, including in Vitebsk -- 50.8, in Polotsk -- 60.9, in Novopolotsk -- 74.6 and in Orsha -- 28.8 kilograms. During the Tenth Five-Year Plan, the oblast's kolkhozes and sovkhozes obtained more than 300,000 tons of unplanned feed, including 55,000 tons collected from the population. Experience has shown that the animal husbandrymen obtain up to 45 kilograms of pork for each ton of such feed fed to their swine. In all, over a period of 5 years, the oblast's farms produced more than 5,000 tons of meat based upon the use of food scraps collected from the population, from trade and public catering enterprises and so forth.

In connection with the rapid increase that has taken place in the volumes of food scraps being collected, a question has arisen concerning their correct use and storage. In 1975, based upon the initiative of the director of the Sovkhoz Selyuta imeni 50-Letiya SSSR in Vitebskiy Rayon S.P. Pyashchinskiy, the former chief engineer of this farm V.V. Khotkevich and the chief veterinary doctor V.G. Bermont, a technology was developed and introduced into operations at the farm for processing food scraps obtained from the population into meal and granules. This technology is valued very highly and author's rights have been extended to its initiators. In 1979 the sovkhoz produced more than 2,000 tons of dry feed from food scraps.

The technology for preparing feed from food scraps consists of the following. Upon arrival at the farm, the food scraps are moved via a freight conveyer to an AVM drying unit where they are subjected to initial drying at a temperature of 75-80°, at the outlet of the dryer drum. The delivery of the food scraps in natural form (without grinding) precludes the possibility of their adhering to the walls of the drum or becoming scorched and sticking to it, it promotes better retention of the nutrients and it facilitates the separating out of the non-feed impurities. Scraps that have been dried to a moisture content of 35-40 percent move from the dryer drum into the hopper of a large cyclone. In the process, large feed impurities (bones, large lumps, potatoes, beets and so forth) and non-feed materials (rocks, sand, glass, metal objects and so forth) fall into a special trap built into the pipe of the large cyclone. This trap differs from those found in the manufactured AVM units. From the mentioned hopper, the food scraps are moved to the unit's batcher and from there via the conveyer to a trench for temporary storage. They are periodically fed to a grinder with the aid of a bucket conveyer, passing through magnetic traps both prior to and following the grinding operation. The dried, ground (to 1.5-2 cm in size) and sorted scraps are passed to a storage container and as they accumulate they are moved on to a second AVM unit, where their final drying out takes place and where they are decontaminated against pathogenic and saprophytic microflora at a temperature of 120-125°C, at the outlet of the dryer drum. The dried scraps are ground into flour in the unit's mill.

As they accumulate, the feed and non-feed impurities which collect in the trap enter a bath consisting of a saturated solution of common salt, located near the unit. Here the non-feed impurities sink to the bottom, while the feed impurities remain floating on the surface and are collected by the buckets (with openings) for the conveyer. The latter delivers them to the grinder where they are processed in a manner similar to that described above.

Scraps from enterprises of the food industry which are of a small fraction and homogeneous composition (pulp residue, kaniga and so forth) are delivered to the second AVM unit and dried out in one regime, at a time when the dried out and ground food scraps are in the storage container. At this same time, it is possible to prepare grass meal using this same unit.

The meal processed from grass and food scraps obtained from the population and industrial enterprises are mixed in an OKTs unit with flour obtained from forage grain, protein-vitamin and other required additives and granulated on any granulator. The prepared granules are delivered to a finished products storehouse.

An evaluation of the food value of the granules, conducted by sovkhoz specialists under the direction of workers from the All-Union Scientific-Research and Planning-

Technological Institute for the Mechanization of Animal Husbandry, revealed that 1 kilogram of granulated food scraps contains 0.9 kilograms of feed units and 93.6 grams of digestible protein.

In addition to food scraps, the preparation of feed granules at the farm also involves use of scraps that were left uneaten by the livestock: straw, silage, haylage, sunflower husks, apple and berry pulp residue and other scraps.

The granules are prepared using different recipes for swine and large-horned cattle. The granules for swine containe the following components (in proportions of the overall quantity): food scraps (50 percent), mixed feed (43 percent) and grass meal (7 percent); for large-horned cattle: flour made from food scraps (37 percent), forage grain (12-13 percent), straw (12.5 percent), kaniga (25 percent) and sunflower husks (12.5 percent).

Such granules are stored in kraft paper bags and kept in a dry darkened storehouse. Under such conditions, their nutritional value is preserved even for extended storage (more than 6 months).

In accordance with the plan for the Vitebsk Branch of the Belorussian Sel'khozstroyproyekt Institute, a shop was built at the sovkhoz for the production of granulated feed based upon the use of food scraps as the principal component. All of the processes in this shop have been mechanized completely. The shop is capable of annually processing 21,500 tons of food and fodder industrial scraps, producing 815 tons of grass meal and preparing 8,570 tons of granules. Two AVM-0.65 units, an OGM-0.8 granulator and an OKTs-15 mixed feed unit have been installed here. The production cost for 1 ton of complete ration granules, prepared for swine, is 114.37 rubles. The shop operates on a double shift basis. Each shift includes one tractor operator, two operators and one worker. The economic effect realized from the preparation of granulated feed in this shop is 93,700 rubles annually.

The use of the technology developed at the Sovkhoz Selyuta imeni 50-Letiya SSSR for processing food scraps has made it possible to increase considerably their efficient use throughout the year and to include such scraps in the composition of dehydrated complete ration balanced mixed feeds. In turn, the feeding of the latter to swine promotes growth in the productivity of the animals, since the substitution of meal obtained from food scraps for 30-50 percent of the standard mixed feed makes it possible to obtain high average daily increases in live weight in the swine during fattening. The inclusion in livestock rations of feed prepared according to this technology does not bring about a deterioration in the quality of the meat or lard of the animals and it does serve to reduce the production cost for the final product. Workers from rural and municipal economies not only from various oblasts in Belorussia but also from the Ukraine, the Russian Federation, Kazakhstan and other union republics throughout the country are visiting the Sovkhoz Selyuta imeni 50-Letiya SSSR for the purpose of studying the experience accumulated in preparing dehydrated complete-ration feed, with use being made of food scraps for this purpose. During 1980 alone, in response to requests received from agricultural and municipal services in other oblasts of our republic, the Vitebsk Branch of the Belorussian Sel'khoztekhproyekt Institute sent out 27 sets of documentation on the method employed for processing food scraps at the mentioned sovkhoz.

In October of last year, an all-union production-technical seminar was held in the oblast on the theme "Improving the Collection of Food Scraps for the Purpose of Using Them for Feeding To Livestock." Those who participated in this seminar acquainted themselves with the work of the municipal economy of Vitebsk in organizing the collection of food scraps and also with the work of the shop responsible for processing them into granules at the Sovkhoz Selyuta imeni 50-Letiya SSSR. Taking into account the experience shared by the representatives of other republics, the executive committee of the Vitebskaya Oblast soviet of people's deputies adopted a decision calling for measures aimed at improving the organization of food scrap procurements and their use for feeding to livestock. In this document, special attention was focused on increasing the volume of food scraps being collected, on ensuring that such scraps are collected entirely from the residents of multi-apartment dwellings, on providing facilities for the temporary storage of the scraps and on equipping such facilities with the means for washing the scrap containers. The schedules for the construction of a garage and a repair workshop were established. The Orshanskiy and Polotskiy rayon executive committees were tasked with building, during the 1981-1982 period, shops for the processing of food scraps, with use being made of the plan developed for the Sovkhoz Selyuta imeni 50-Letiya SSSR.

In the interest of achieving a more complete collection of food scraps and improving the sanitary condition of the housing fund, the executive committee of the Vitebskaya Oblast soviet of people's deputies submitted a petition to the Council of Ministers for the BSSR requesting that provision be made for separate garbage lines for food and domestic scraps when planning the construction of new dwellings more than six stories high.

An increase in the collection and the proper use of food scraps for the fattening of livestock represent an important reserve for solving the food program.

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LITHUANIAN CONFERENCE CONSIDERS FEED, LIVESTOCK WINTERING

Vilnius SOVETSKAYA LITVA in Russian 25 Sep 81 pp 1,3

[Article: "Important Tasks for Livestock Wintering"]

[Text] Zonal seminar-conferences on questions of wintering livestock were held in the republic this week. Participating in that were the first secretaries of party raykoms, chiefs, head zootechnicians and veterinaries of agricultural administrations, managers and specialists of the Ministry of Agriculture, leaders of departments that serve agriculture, and scientists.

The results of the production of animal husbandry products during this period will depend primarily on feeds. By the last 10 days of this month the farms of the republic had stored up approximately 10 quintals of feed units of grass feeds for each head of livestock. This is not enough. Moreover, many of the rayons and farms have even less feeds than this. Therefore it is necessary to continue everywhere to prepare silage and grass meal from aftergrowth and grasses that grow in other places. This is being done in some places. For example, the farms of Shirvintskiy, Vil'nyusskiy, Ignalinskiy, Ionishkskiy and Radvilishkskiy rayons during the past week have stored up another 0.5-1.8 quintals of feed units per head of livestock. Unfortunately, there are not many examples like this, and in some places they have completely stopped producing grass feeds. There is absolutely no justification for the fact that many farms are not using their sets of equipment for producing grass meal. It is necessary for as many of them as possible to operate until late autumn, for grass meal will become the most valuable replacement for concentrates, of which, as we know, there will not be enough.

Although the weather has been favorable, not all of the straw has been gathered. This is a great mistake. It is necessary to remove it immediately and use it for producing silage, place some of it in sheds and stacks, and to store it promptly and correctly. Corn, sugar beet tops, potato tops and vegetable residuals should also be used for producing silage.

Since the amounts of feeds that have been prepared are inadequate, farm specialists should now develop the most efficient variants for their utilization so as to produce as much meat and milk as possible to fulfill the plan for the sale of animal husbandry products to the state. In the opinion of agricultural production leaders and scientists, this year it will be necessary to contribute the feed to the livestock in a differentiated way, taking into account its quality and also the kinds of livestock and the productivity groups. The greatest problem will be with concentrates. Therefore it is necessary first of all to divide them into feeds for hogs, calves, and dairy cows. The rations of pregnant cows and livestock on fattening should be comprised of straw, kibbled feed, silage and haylage. Root crops should be given mainly to calves, sows, breeding hogs and dairy cows.

In order to compensate if only partially for the shortage of concentrates in the rations of hogs, especially the basic herd, it is recommended that they be given more grass meal, root crops, mixed silage, high-quality clover and flax husks. There can be no question about the importance of mixed silage in this case. It is produced by many farms of Kapsykskiy Rayon and several farms of Kaunasskiy and Radvilishkskiy rayons. They obtain weight gains as a result of this. Therefore everyone should engage seriously in preparing this valuable feed. In order to augment the hogs' rations with juicy feeds, in some places it is necessary to purchase a certain amount of potatoes from the population. And this must be done now. Since the mixed feed industry will not be able to prepare the necessary quantity of concentrates for feeding sows and piglets this year, each farm should be concerned about acquiring high-quality feed barley for this purpose.

The Scientific Research Institute of Animal Husbandry has developed sample rations for feeding livestock. These should be used as a basis for drawing up the plan for the utilization of feeds during the winter months not only on the agricultural enterprise as a whole, but also on each farm, and to establish the sequence for their consumption. It is also necessary to make very sure that the feeds, especially the concentrates are not overexpended. At the same time it is extremely important to process the feed correctly before distributing it. Straw should be crushed and the straw of poorer quality should be treated with dehydrated ammonia. It is especially recommended that moist mixtures of coarse feeds with nutritive supplements be prepared for the livestock. The livestock like it and they assimilate it better. Moreover, it is convenient to distribute these mixtures by the mechanized method. There is enough technical equipment for preparing feeds. It is important for the sets of equipment and the areas everywhere to be promptly put into order and for the briquette granule makers to be prepared. Productive utilization of shops for producing mixed feeds is an important support in animal husbandry. Thus the Erishkyay Sovkhoz in Panevezhskiy Rayon last year produced 2,500 tons of valuable feeds at its enterprise. And yet the shop of the Krizhkal'nis Sovkhoz in Raseynskiy Rayon this year produced only 302 tons of products, and the shops on the Zhal'giris and Tayka kolkhozes in Pakruoyskiy Rayon did not operate at all.

And during the forthcoming winter it will be necessary to prepare for producing conifer meal. Wastes from enterprises that process meat and milk should be used for feed. It is necessary to organize the processing of chicken dung better and use it to feed livestock on fattening.

The farms of 20 rayons of the republic now have fewer cows than they did during the same period of last year. This difference must be eliminated immediately. In the very near future it is necessary to increase the number of cows to the amount planned for the end of the year.

It was emphasized at the conferences before the end of this month it is necessary to prepare the grain well for winter. It should be disinfected, bleached and warmed.

In putting the facilities into order, it is recommended that commissions be created for accepting them and organizing inspections. This will block off the path to disorder. But when preparing the facilities for winter the farms come up against certain difficulties: some places do not have enough window glass and some do not have paints for equipment. The farm workers are complaining about the shortage of special clothing and smocks. Organizations that serve agriculture should solve the problems on the spot.

Farms must prepare for wintering in such a way as to avoid diseases and death of the livestock and to obtain good weight gains. In places where there is an especially serious shortage of feeds the agricultural administrations must redistribute them among the farms in good time. The farms should distribute the feeds in such a way as to maintain the planned number of head of livestock, primarily cows, throughout the winter. In order to increase the production of animal husbandry products it is very important to rely on individual subsidiary farming of the rural residents. The kolkhozes, sovkhozes and other state farms should now be concluding agreements for the purchase of livestock from the kolkhoz workers and other workers for next year. In places where the residents have already sold the intended quantity of products according to previously concluded agreements, it is necessary to extend these agreements. Moreover, it is possible for the farms to send hogs to rural residents for fattening during the winter, and helping them with certain feeds. The managers and specialists of the farms and local soviets must better organize the purchase of milk from the population. The number of points where milk is purchased or the number of people selling it must not decrease during the winter period.

Participants in the seminar-conferences expressed their confidence that the farmers will prepare well for wintering, will be able to surmount the difficulties and, having declared animal husbandry to be a shock labor front, will do everything possible to obtain good results.

Speaking at the zonal seminar-conferences on questions of organizing the wintering of livestock were the secretary of the Central Committee of the Communist Party of Lithuania, V. Astrauskas; the deputy chairman of the republic council of ministers, Yu. Bernatavichyus; the chief of the agricultural division of the Central Committee of the Communist Party of Lithuania, V. Normantas; the minister of agriculture, M. Grigalyunas; and other managers.

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INCREASING EFFICIENCY OF AGRICULTURE IN RSFSR

Moscow APN DAILY REVIEW in English 26 Oct 81 pp 1-9

[Article by L. Florentiev, minister of agriculture of the RSFSR: "Raising the Efficiency of Agriculture in the Russian Federation"]

[Text] The questions of the further development of agriculture and of raising its effectiveness were given major consideration in the resolutions of the 26th CPSU Congress and in the Report made at the party congress by Leonid Brezhnev, general secretary of the CPSU Central Committee. This is because agriculture plays a decisive role in the implementation of the party's policy to secure a steady rise of the people's well-being.

The new five-year plan continues the guidelines of the party's agrarian policy worked out at the March (1965) Plenary Meeting of the CPSU Central Committee, at the subsequent plenary meetings and congresses of the party. Despite the fact that the weather over the three years of the past five-year plan period were exceptionally unfavourable for the Russian Federation and some other fraternal republics, the republic's agriculture continued its dynamic progress. Thus, the average annual agricultural output in all categories of farms of the RSFSR was 2,600 million roubles, or 5 per cent higher than in the 9th five-year plan period, and in the public sector--10 per cent higher.

The attained growth in the production of many kinds of products helped considerably increase their purchases and improve the population's access to consumer goods. Per capita meat consumption from 1965 to 1980 grew in the Russian Federation by 19 kg and amounted to 61 kg; milk consumption reached 329 kg with a growth of 58 kg as against 1965; eggs--276, a growth of nearly 100 per cent; vegetables--90 kg (28 per cent). The consumption of potatoes, bread and bakery products decreased during this time.

A total of 81,500 million roubles (as against 59,700 million in 1971-1975) were invested to develop RSFSR agriculture in the 10th five-year plan period alone. The production assets of collective and state farms grew by 50 per cent in five years, and the capital labour ratio increased by 60 per cent. The supplies of mineral and lime fertilizers, tractors and other machinery also increased. More than 3 million hectares of improved lands were put into cultivation. Rural reorganisation work in the countryside was carried out on a wider scale.

In pointing out the work done, it must be admitted that the agricultural development level in the republic and the repayment of huge state investments in this branch cannot be regarded as sufficient, the agrarian sector does not yet fully meet the growing requirements of the population, especially in meat and milk.

There is no doubt that the unfavourable weather conditions as well as the non-fulfillment by industrial and building branches of their commitments to the countryside told negatively on the production results of collective and state farms in the 10th five-year plan. Those industries failed to put into cultivation reclaimed lands, to supply villages with some types of equipment, mineral and lime fertilizers, to build by contractual construction organisations houses, cultural and service establishments and production facilities in collective and state farms.

In accordance with the Guidelines for the Economic and Social Development of the USSR for 1981-1985 and for the Period Ending in 1990, the average annual production of farm produce in the RSFSR must grow by not less than 12-14 per cent in 1981-1985.

To raise soil fertility and yield capacity and ensure further growth in the production of grain and other types of products by using zonal scientifically-sound methods of farming have been and still remain the main task in agriculture. Fulfilling commitments to the state and ensuring inter-farm requirements will bring gross grain harvest in the next few years to 155-160 million tons mainly by raising the yield of grain crops to an average of 20-22 metric centners per hectare in the republic.

Taking into account the fact that the need in food grain is met fully, farms lay the main stress on growing forage crops whose share in the gross grain yield will considerably increase. With these aims in view there are plans to expand the cultivation of corn for grain as well as soybeans in the North Caucasus and in some other districts. Measures are being taken to considerably step up gross harvests of green peas, barley and oats, increase the production of millet, buckwheat, rice, rye, durum and durable strains of wheat. In the current five-year plan work will be continued to improve the structure of the areas sown to grain by taking into account the natural and economic conditions in various districts of the republic.

The elaboration of the comprehensive programme of measures is being completed to raise soil fertility in the collective and state farms of the RSFSR for 1981-1985. This programme outlines the dates for mastering correct crop rotations and raising their effectiveness. This will be greatly facilitated by increasing the areas of crop rotations and fields in them (this was proved in practice by many farms of the Stavropol Territory, the Saratov, Voronezh and some other regions) there will be further expansion of the soil protection system, which envisages a growth in the amount of soil cultivation with mouldboardless plough up to 25 million hectares by 1985, the sowing by special anti-erosion seeders--up to 22 million hectares. Other measures are carrying out methods to prevent water erosion of soils, especially on the farms of the Non-Black Earth Zone and the Central-Black Earth district; improving seed-growing and accelerating the plant-breeding process; expanding land reclamation and the comprehensive mechanisation of many labour-consuming processes and branches in agriculture; reducing the farming and harvesting time; taking resolute measures against losses from the field to the silo.

The growth in the delivery of nitrogenous mineral fertilizers, the provision of technical crops, vegetables, potatoes and reclaimed lands with them made it possible to direct the entire growth in the delivery of mineral fertilizers towards increasing the production of grain and fodder.

To improve the supply of the population with vegetable oil, in the 11th five-year plan the republic's farms will step up the average annual production of oil-bearing crops (specifically, sunflower seeds by 30 per cent) mainly by raising their yield, introducing industrial technology in cultivating them, radically improving seed-growing in farms as well as in research institutions, considerably strengthening the material and technical base of storing oil seeds at enterprises of the ministries of procurements and the food industry.

Sugar beet growing collective and state farms of the republic are to do a great deal to remove the lag in sugar beet cultivation. Its average annual production is to be brought to 33-34 million tons in the current five-year plan as against 25.5 million tons in the 10th five-year period. Work will be continued to transfer sugar beet growing to industrial methods, for which it is necessary to increase supplying the farms with effective herbicides, row-crop tractors, highly-productive sugar beet loaders and other machinery. By the end of the five-year plan sugar beet yield in the republic will go up to an average of 215 metric centners per hectare and in the main sugar beet-growing districts--to 250-270 metric centners or more.

The collective and state farms are carrying out a special-purpose programme worked out in the republic for the development of potato-growing. It includes a comprehensive mechanisation of the branch and improvement of potato cultivation technology, a growth in the application of organic fertilisers, qualitative preparation of seed tubers by bringing the plantings to maximum density, carrying out necessary protective measures against diseases and pests.

In the 11th five-year plan the average annual production of vegetables will increase by not less than 20 per cent. On the basis of production cooperation with the recently created Ministry of Fruit and Vegetable Growing, work will be completed in the next few years to transfer the areas sown to vegetables to irrigated farming, efforts will be continued on the concentration of the areas sown to marketable vegetables at specialised farms, on raising the efficiency of running the branch, its mechanisation and chemicalisation. Special attention is paid to considerably reducing the losses of harvest during harvesting, transportation and storage, sharply raising the variety and quality of vegetables. Work is continued on a vast programme of building hothouses, above all close to large cities, industrial centres, resort zones and BAM.

Important tasks are to be accomplished in the next few years to increase the production of fibre flax and improve its quality by shifting the processing of flax straw from the field to the plant, to eliminate the risk run by the farms preparing flax by the method of dew retting, strengthening the material and technical basis of seed growing in collective and state farms and at seed flax stations.

For 1981-1985 the Guidelines for economic and social development plan to ensure in the RSFSR an average annual production of meat (in slaughter weight) not less than 8.4-8.7 million tons; milk--50-52 million tons; wool--235,000-240,000 tons (in the 10th five-year plan their production was 7.4 million, 48.2 million and 221,000 tons accordingly). The main reserves and potentials of livestock breeding are the considerable improvement in the use of production capacities of large specialised livestock-breeding farms, whose number has sharply increased in the past decade. In addition, it is necessary to utilise more fully the possibilities of growth in the output of animal produce in specialised collective and state farms, in subsidiary holdings, in industry, at public catering enterprises as well as at private subsidiary plots of the rural population.

The republic has worked out and is carrying out comprehensive programmes for increasing the production of beef and pork, measures to further develop sheep-breeding and poultry-farming on the basis of specialisation and inter-farm cooperation.

In the 11th five-year plan further development will be achieved in reindeer, horse- and rabbit-breeding, fur-farming, as well as pond fishing, bee-keeping and silkworm breeding.

Now that the production basis of livestock-breeding branches has been considerably strengthened and the level of their concentration and specialisation has been raised, special attention will be paid to fodder production which has become a decisive factor in the intensification and accelerated growth of animal produce, in raising the effectiveness of livestock-breeding. Fodder production is gradually becoming an independent, specialised branch. Its production base is being strengthened, for which 4,100 million roubles have been invested in the current five-year period (in the past five-year period it was 2,400 million roubles and in the 9th--400 million roubles).

The measures being taken tell favourably on the production of fodder and its quality: the average annual procurements of coarse and succulent fodder in the 10th five-year plan period amounted to 56.6 million tons, exceeding the level of the 9th by 8.4 million tons of fodder units. In the new five-year period, the production of coarse and succulent fodder must grow up to 76.6 million tons of fodder units, their quality will be considerably improved, the production of fodder protein will be sharply increased by enlarging the area sown to peas, vetch, lupine, as well as soybeans, lucerne, clover and other protein-rich crops.

Major tasks are to be fulfilled in the current five-year plan by turning the Non-Black Earth zone of the RSFSR into an area of highly-effective crop farming and livestock breeding and by developing industrial branches connected with them.

By implementing the decisions adopted in the resolution of the CPSU Central Committee and the USSR Council of Ministers "On Measures to Further Develop Agriculture of the Non-Black Earth Zone of the RSFSR" (1974), the realisation of a wide complex of measures was started in the 10th five-year plan to develop agriculture in the Non-Black Earth zone of the republic. A total of 31,200 million roubles were invested in the development of this branch and industries connected with it. This is 11,700 million roubles more than the sum allocated in the 9th five-year plan. The collective and state farms as well as other agricultural enterprises of the zone were supplied with a large number of tractors, lorries and other machinery. The supplies of mineral fertilizers rose by 40 per cent; a total of 954,000 hectares of drained and 347,000 hectares of irrigated lands were put into cultivation.

The rates of rural reorganisation have raised. In the last five-year period the collective and state farms of the Non-Black Earth zone have built 14.5 million square metres of housing, pre-school institutions for 136,000 children, general educational schools for 197,000 pupils as well as clubs and houses of culture for 166,000 people.

All this favourably affected the development of agricultural production in the zone. In the difficult weather conditions of the past five-year period the average annual grain production grew by 7.8 per cent, meat--by 6 and eggs--29 per cent; milk purchases went up, as did the number of all kinds of cattle and poultry.

The resolution of the CPSU Central Committee and the USSR Council of Ministers "On Further Development of Agriculture and Enhancement of Its Effectiveness in the Non-Black Earth zone of the RSFSR in 1981-1985" (April 1981), which continues the party's policy for a rapid upsurge in the agriculture of that region, became a new manifestation of concern for the Non-Black Earth zone. In 1985 the production of farm produce in the zone must grow by 30 per cent as compared with the level attained in the 10th five-year plan. Special stress is being laid on improving the use of land. A total of 1,770,000 hectares of drained and irrigated lands will be put into cultivation during the five-year period, 18.4 million hectares of acid soils will be limed, the volume of land improvement work will be considerably expanded, the supplies of equipment, mineral fertilizers and the application of manure and compost to the fields will be raised considerably.

Questions of rural reorganisation, of expanding the construction of dwellings, cultural and welfare institutions, and creating favourable working and living conditions for agricultural workers stand out prominently in the work of collective and state farms in the Non-Black Earth zone.

Of great importance for the further development of agriculture is to enhance the level of technology on farms, to strictly observe on each collective and state farm scientifically sound systems of running agriculture and optimal schedules.

To further improve seed-growing is one of the urgent and important tasks for improving land use and raising yields.

To improve the use of mineral fertilizers and lime materials, and to increase the application of organic fertilizers are important ways of raising the effectiveness of the republic's agricultural production.

Further development of specialisation and interfarm cooperation in the branch is to be ranked among the important factors for raising the effectiveness of agricultural production. The republic will go on improving the distribution of agriculture, taking into consideration the conditions and peculiarities of various economic districts as well as the arrangement of industrial enterprises, and transport communications in them and, what is mainly, by considering the mounting requirements of the country in foodstuffs and agricultural raw materials.

Work will be continued in the 11th five-year plan to further develop the specialised zones of the commodity production of grain, sugar beets, sunflowers, intensive dairy and meat livestock breeding, sheep-breeding and the poultry industry, the production of vegetables, fruits and grapes, tea, fibre flax and other products.

Specialised horticulture, vegetable-growing farms and hothouses will be developed and the production of fruits, berries and vegetables on non-specialised collective and state farms will be increased at the same time, just as it will be on personal subsidiary plots of the rural population.

The most important feature of the current five-year period will be its large-scale measures to reorganize the countryside, extensively build houses, cultural and welfare institutions and roads, further improve the working and living conditions of rural workers. All this will encourage people to remain on collective and state farms.

CSO: 1812/10

SPACE PROGRAM, STUDIES IN BEHALF OF AGRICULTURAL PRODUCTION

Omsk ZEMLYA SIBIRSKAYA, DAL'NEVOSTOCHNAYA in Russian No 8, Aug 81 pp 61-63

[Article by S.M. Ovchinnikov, senior scientific worker in the Laboratory for Geography and Cartography of Soils of the Institute of Soil Science and Agrochemistry of the Siberian Branch of the USSR Academy of Sciences: "Space and a Study of the Soil Cover"]

[Text] Western Siberia is an area in which considerable supplies of soil and forest resources and rich deposits of petroleum and gas are concentrated, with these resources being spread over a vast and almost inaccessible territory. When preparing new regions for development, the specific conditions of the particular territory must be taken into account completely: on the one hand, for ensuring more complete use of all available resources and, on the other, for reducing to a minimum the harm inflicted upon nature.

The collective at the Institute of Soil Science and Agrochemistry is devoting a great amount of attention to evaluating the status of the land resources and to forecasting qualitative and quantitative changes in them in a timely manner. The work carried out in connection with conducting an inventory of the land resources, despite the fact that it produced rich material for describing the development of the natural process in western Siberia, nevertheless is clearly inadequate for solving many of the problems of economic development for the region, especially its northern part. Actually, the traditional ground methods for studying the soils in the taiga landscapes of western Siberia are at the present time exceptionally complicated and require a great amount of manpower and resources. The development of space equipment and the creation of multiple-purpose artificial earth satellites and orbiting stations have opened up new horizons in the field of remotely controlled studies of natural resources on the whole and the soil covering in particular.

When studying the soil covering and when composing soil maps or correcting them, an objective description of the natural features of the territory being mapped, a high degree of accuracy and good detail in the soil covering depicted and a scientifically sound generalization of it are required. The use of information obtained as a result of space studies exerts considerable effect with regard to solving these tasks.

In recent years, the landscape principle of presentation has been employed when carrying out soil map-making work involving the use of space photographs. Such an approach for interpreting the mutual dependence and interaction of natural-territorial complexes is more correct, since a territory is divided up into geographic regions (districts) -- this is not just a combining of data on geology, relief, climate, tectonics, soils, vegetation and the animal world for a given territory, but rather it is an analysis of all of the historically conditioned processes taking place in the districts.

Using space photographs, the types of soils can be seen as territories that have not been plowed up or that are not covered with vegetation, based upon direct decipherable characteristics: according to the tone and color of their representation and the texture, form and size of the soil contours. But the same soils can have different decipherable characteristics depending upon the specific moisture conditions at the time of the survey, upon their susceptibility to erosion and upon other factors that complicate the soil deciphering process based upon direct characteristics. Considerably more frequently and especially in taiga districts, the soils are interpreted by means of regular combinations of vegetation, lithology and relief, which possess prominent external aspects. An analysis of photographs taken from the orbiting station Salyut has shown that the differentiation of a soil covering on a territory occupied by vegetation is manifested even better than on tracts that are free of vegetation, since plants respond very clearly to even a slight change in the soil covering.

Soil-display interpretation is based upon an analysis of the image of space photographs and earlier established interrelationships between the soils and other landscape components. The character of the spatial illustration and the tone of the space photographic image, formed by various combinations of the forms of relief and forest vegetation and its geometry, reflect in extremely reliable manner the structure and distribution in space of the components of the soil covering. This makes it possible to describe quantitatively the diverse soil covering expressed on the terrain and to portray it in more detail on the soil maps. When summarizing diverse cartographic materials, the only objective approach should ideally be based upon materials obtained as a result of a different-scale survey carried out from space.

Mention should also be made of the great opportunities available for studying, based upon space photography, the structure of the soil covering and the territorial combinations of different soil types and sub-types typical of various natural conditions. This problem is becoming of increasing importance in the modern geography of soils.

The remotely controlled recording of various structures of the soil covering of taiga districts in western Siberia should ideally be developed based upon a step by step survey conducted from space, using a different scale and for the various seasons of the year. Space photographs of fine resolution show large elements of relief and lithological-geomorphological complexes. Winter photographs provide good interpretations of a combination of hydromorphic and semi-hydromorphic soils (light contours of swamps and light-grey contours of swampy forests) and also complexes and combinations of automorphic soils of elevated areas (dark-grey tone of contour if there are no tree-felling areas or large fire-scarred areas). The borders of districts, the economic activities of man (tree-felling areas, agricultural lands among forest tracts) and the borders between large forest areas which differ in structure (dark coniferous, light-coniferous and deciduous types) are all expressed very clearly.

The structure of a landscape is clearly visible in photographs of average resolution. Moreover, large relief forms, diverse forest tracts, swamps, swampy forests with hydromorphic soils and drainage elements of relief having automorphic soils are all interpreted very well. The mosaic nature of a stand of timber is noticeable, expressed by various combinations of photo-tones (spotted, granular and so forth). In accordance with the representation of a photo-tone, which expresses the mosaic nature of vegetation, the diverse forms of relief and a drainage system, one can make a judgment regarding the complexity and contrasting nature of the structures in a soil covering of a terrain and natural boundary.

Pictures of large-scale resolution providing an adequate view are more informative for studying the facial structure of a natural boundary. The structure of a soil covering is interpreted clearly and efficiently according to its meso- and micro-relief forms, especially in the case of winter photographs; according to the specific structure of a stand of timber and the representation of the photo tone; moreover, the geometry of the structure of the soil covering is well expressed.

In connection with the intensive development of the natural resources of western Siberia, terrain changes take place so rapidly that the soil scientists, after having created a soil map using the conventional and traditional methods, are forced into immediately defining it more precisely. In order to obtain an image of the earth's surface, which space photography provides within a short period of time, the cartograms of the preceeding generation required tremendous expenditures of resources, tens of years of ground survey work and many and varying types of computations.

From a soil-geographic standpoint, the benefit derived from the use of information obtained from artificial earth satellites, piloted space vehicles and orbiting stations is immeasurable in that it ensures broad covering of the earth's surface using all types of survey means and it raises the operational efficiency of a soil scientist and the accuracy and completeness of studies. When gathering data from space there are no inaccessible or only slightly accessible regions.

It bears mentioning that the arsenal of long distance methods for studying the soil covering is not limited to photographs in the optical range. Great interest is being displayed in the use of microwave equipment for studying the temperature and moisture content of soils. The images and materials obtained by non-photographic means represent a valuable addition to the photographic methods, since they make it possible to obtain information on the energy emitted by objects under analysis on the earth's surface, distinct from photographs which catch the reflected energy of the sun and in a narrow portion of the electromagnetic spectrum (visible and close to infra-red -- up to 1.1 microns).

Photo-electronic indirect systems encompass the entire range of the electromagnetic spectrum. They are subdivided into passive, among which more extensive use is made of infra-red radiometers, and active -- radars and lidars, which operate in zones from ultra-violet to near infra-red. In terms of resolution, infra-red space images are inferior to photographic shots and thus for a definite moment of a survey they can be used as interesting additional information for space photographs. At the same time, infra-red images can be of tremendous independent interest for studying hydrothermal anomalies in pictures taken at night, during the day or at various times and seasons. The most valuable property of this new type of survey of a soil covering lies in the fact that a radar unit can operate in the absence of visibility: through fog and cloud cover and also at night.

Studies in the use of microwave equipment reveal that recordings of emissions in the microwave range make it possible to distinguish up to 10-15 gradations of moisture content in the upper layer of soils, but this is possible only for moisture content values which are higher than a definite level -- approximately 20 percent for soils of a heavy mechanical texture and approximately 10 percent -- for light sandy and sandy loam soils. The development of long range methods for recording the moisture content of soils opens up the possibility of determining it in a rapid manner and this is a vital concern for the southern rayons of western Siberia, where more extensive use is being made of irrigation farming.

Despite the great potential of microwave equipment for studying a soil covering, it bears mentioning that it nevertheless should be employed jointly with photographic methods. The use of both methods will make it possible to carry out accounting and control over the use of soil resources in a more rational manner, evaluate the fertility of soils and find more optimum means for the development of land reclamation operations.

In view of the intensive development of open deposits of petroleum and gas in the regions of western Siberia, there are almost no areas where man has failed to leave traces of his activities on the natural landscape as a whole. Quite often the plant cover is destroyed or the surface layers of soil are removed and this tends to intensify the process of surface water and wind erosion. This leads to deformation of the surface and disruptions in the conditions for surface flow, which in turn results in a rise in ground water and the formation of water areas. It is known that a disruption in the plant and soil cover or a change in the temperature regime of soils or in the depth of their seasonal thawing and freezing serve to activate the freezing-geological processes. At any moment it is necessary to know and to determine the limits for acceptable interference by man in the natural processes, including agricultural development with the natural environment effectively fulfilling its geochemical and ecological functions and favoring the social requirements and needs of society.

From the standpoint of developing scientific principles for protecting the environment, special importance is attached to current and predicted evaluations on the dynamic equilibrium of natural systems, their energy and material potential and on the ecological dynamics of successes. This is associated with the principal trends for developing the fundamental and applied problems relating to the natural environment, for the rational use of natural resources and for protecting and improving the environment. For solving the tasks that have been assigned, use must be made of space information which properly reflects anthropogennic influence generally and even more clearly -- disruptions in forest vegetation: tree-felling areas, areas scarred by forest fires, plowed lands and soil erosion.

Special importance is attached to the use of space photographs for studying the direct contamination of the natural environment -- soil, water and air. Space information on the status of the natural conditions of the earth's surface makes it possible to carry out various ground measures for protecting the environment in a timely and rational manner.

The use of space equipment facilitates a study of the soil processes, it raises the accuracy of cartographic materials and it ensures systematic control over the status of and trends in the development of the natural and technogennic processes. Space studies are becoming loyal assistants to agricultural workers for solving the vital and long range tasks of agricultural production.

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BRIEF

AERIAL SURVEY OF FIELDS--The status of winter crop sowings and the supplies of biomass out on the fields and pastures in five oblasts of the non-chernozem zone are being evaluated by specialists attached to the Northwestern Administration for Hydrometeorology and Control Over the Natural Environment. They have completed their first series of flights aboard an aircraft -- an IL-14 flying laboratory. This inspection of the green cover was carried out for the very first time using a remotely controlled photometer. The electronic "eye," the action of which is based upon the recording of reflected solar radiation, exercises control over the entire flight route on a continuous and highly accurate basis. The scientists will compose a full description of the pre-winter status of the fields within 10-15 days. [Text] [Moscow SOTSIALISTICHESKAYA INDUSTRIYA in Russian 30 Sep 81 p 2] 7026

AGRO-ECONOMICS AND ORGANIZATION

INDUSTRIAL DEVELOPMENT OF AGRICULTURE EMPHASIZED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 9, Sep 81 pp 89-95

[Article by G. Ponomarev, deputy chief of a department at USSR Gosplan: "Industrial Base of Agriculture During Eleventh Five-Year Plan"]

[Text] The Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990, approved during the 26th congress of the Communist Party of the Soviet Union, represents a great contribution by the party in the sphere of agriculture towards its further development during this modern stage. In recent years, the party's policies have been aimed at systematically solving the key problems concerned with the development of this most important branch of the national economy.

Substantial changes have taken place in agriculture as a result of scientific-technical progress. Many branches of agricultural production have been converted over to an industrial basis. Specialization, concentration and agroindustrial integration of agricultural production are being implemented.

Prolonged and stable progress in agricultural development following the March (1965) Plenum of the CC CPSU is being achieved mainly through the accelerated equipping of it with fixed capital, in the structure of which priority importance is being attached to the machines and equipment. Agricultural intensification requires technical rearming of and constant improvements in agricultural equipment and, on this basis, improvements in the power-worker ratio, all-round mechanization and in the electrification and automation of production. It is on this basis that growth will be achieved in agricultural output and labor productivity.

During the Tenth Five-Year Plan, agriculture was annually supplied with more than 364,000 tractors, approximately 270,000 trucks, 280,000 tractor trailers, 20,000 excavators, 21,000 bulldozers and approximately 107,600 grain harvesting combines. The average annual volume of deliveries of agricultural machines reached more than 4.5 billion rubles.

Compared to 1965, the tractor pool in agriculture in 1979 increased by a factor of 1.6, trucks -- by 1.85, grain harvesting combines -- by 1.4, tractor trailers -- by more than threefold and excavators and bulldozers -- by almost twofold.

Whereas in 1965 the power-worker ratio for one agricultural workers was 7.7 horsepower and 100 horsepower was employed per 100 hectares of area under crops, by the beginning of 1980 these indicators had increased respectively to 25.4 horsepower and 280 horsepower. At the present time, there are 2.6 million tractors, approximately 720,000 grain harvesting combines, 170,000 excavators, 175,000 bulldozers, approximately 70,000 scrapers and also a large pool of various types of agricultural machines, all of which are employed for carrying out practically all of the agricultural technologies.

The use of electric power has been expanded considerably. Whereas at the end of the Eighth Five-Year Plan the overall consumption of electric power in agriculture amounted to 38.6 billion kilowatt hours and in 1975 -- 73.8, by 1980 the figure had risen to 109 billion, including 82 billion kilowatt hours for production purposes.

A typical feature of the Eleventh Five-Year Plan is that of further introduction of industrial technologies into agricultural production. They will be used extensively not only in stationary technological processes associated with the production of pork, beef, meat, poultry and eggs, but also for certain and formerly more labor consuming operations associated with the production of corn grain, sugar beets, feed, potatoes, raw cotton and other agricultural products.

In recent years, industry has followed a program aimed at improving the quality of the equipment being supplied to agriculture and raising its technical-economic indicators. Agricultural equipment must be reliable and highly productive, involve a low level of operating expenses and satisfy the aesthetic requirements of the personnel responsible for operating it. Thus, during the Eleventh Five-Year Plan, the plans call for more rapid rates of growth in the power indicators for tractors compared to their quantitative growth. The load carrying capabilities of motor vehicles are being raised sharply, the tonnage of tractor trailers is being increased, the carrying capacity of grain harvesting combines is being raised and a greater number of self-propelled harvesting machines will be produced.

At the same time, the task has been assigned of raising considerably the effectiveness of use of the powerful production potential created in agriculture. During the 26th Congress, L.I. Brezhnev stated "an arm of economic policy is a matter that is both simple and very routine -- a thrifty attitude towards public property and the ability to make complete use of everything that is at our disposal"*.

In conformity with the Basic Directions for the Economic and Social Development of the USSR During the 1981-1985 Period and for the Period Up To 1990, the plans call for agriculture to be supplied with tractors, trucks and grain harvesting combines in the quantities shown in Table 1.

Based upon the data, it is apparent that the increase in the volumes of tractor deliveries during the Tenth Five-Year Plan amounted to 120,000 units, with 50,000 units planned for the Eleventh Five-Year Plan. In the process, the increases in the power capabilities of the tractors for the five-year plans will be 31 and 32 million horsepower respectively. The deliveries of trucks during the five-year plans increased respectively by 250,000 and 100,000 units; their load carrying capability during the Tenth Five-Year Plan rose by 1.4 million tons and during the Eleventh Five-Year Plan -- by 2.1 million tons.

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* "Materialy XXVI s"yezda KPSS" [Materials of the 26th CPSU Congress]. Moscow, Politizdat, 1981, p 42.

Table 1

	1971-1975	1976-1980	1981-1985	1976-1980 in % of 1971-1975	1981-1985 in % of 1976-1980
Tractors, thousands of units	1700	1820	1870	107	102.7
Total amount of tractor engine power, millions of horsepower	119	150	182	126	121.3
Trucks, thousands of units	1100	1350	1450	122.7	107.4
Total amount of load carrying capability of motor vehicles, in thousands of tons	3458	4866	6950	140.7	142.8
Grain harvesting combines, thousands of units	449	538.9	600	120	111.3
Total amount of carrying capacity of grain harvesting combines, in thousands of kilograms per second	2099	2865	3682	136	128.5

Excavators, bulldozers and scrapers of great power and productivity will be supplied during the Eleventh Five-Year Plan for implementing the program for land reclamation and highway construction in the rural areas. By the end of 1985, the power engineering capabilities of agriculture will amount to approximately 900 million horsepower, compared to the 1.25-1.3 billion horsepower required for the optimum equipping of agriculture and the carrying out of all field, transport and stationary operations during the best periods. Growth in the power engineering capabilities and in the power-worker ratio in agriculture is reflected in Table 2.

Table 2

(in millions of horsepower)

	By Years					
	1960	1965	1970	1975	1980	1985
Power engineering capabilities including:	152.8	231.7	322.0	457.4	609.0	900.0
tractors (power of engines)	50.3	84.9	121.8	169.9	216.8	287.3
motors of combines	24.7	35.6	46.1	59.1	76.0	120.0
motor vehicles	63.2	81.9	103.6	131.6	170.0	262.0
electrical units	7.2	19.3	40.7	85.4	130.0	167.0
Increase in power engineering capabilities of agriculture	-	78.9	90.0	135.4	151.6	320.7
Power engineering capabilities:						
per agricultural worker, horsepower	5.4	7.7	11.2	16.8	25.4	39.0
per 100 hectares of area under crops, horsepower	74.0	100.0	148.0	190.0	280.0	395.0

It is apparent from the table that by the end of 1980 the power engineering capabilities of agriculture had reached 609 million horsepower, that it had increased by almost 287 million horsepower over a period of 10 years and that by the end of 1985 it will have increased by almost another 300 million horsepower.

Tractor construction is the foundation for agricultural power engineering. During the Eleventh Five-Year Plan, further development must be achieved in this most important branch of the national economy. The plans call for the construction and modernization of tractor construction enterprises. This will make it possible to supply agriculture with new and modernized tractors marked by a higher technical level and this in turn will ensure the following technical-economic indicators:

...raised productivity by a factor of 1.25-1.5 for certain types of agricultural units, for an appropriate grouping of agricultural machines, including those used for carrying out new industrial technological processes associated with the production of agricultural goods;

...combining of technological operations for the purpose of achieving savings in labor and material resources;

...increasing the reliability and durability of tractors, engines and transmissions, with their service life up to initial capital repair work being raised to 6,000-8,000 hours;

...reducing the specific materials consumption of wheeled and caterpillar tractors to 34.5-72.5 kilograms per horsepower, compared to 42-85.5 kilograms per horsepower in 1975;

...lowering hourly fuel consumption for diesel engines to 170-180 grams per horsepower and oil during operation to 0.5-0.7 percent;

...reducing the time required for the technical servicing of tractors and improving working conditions for the machine operators.

During the Eleventh Five-Year Plan, for the purpose of carrying out those agricultural operations which consume large amounts of power, agriculture will continue to be supplied with powerful K-701 tractors (these are the principal plowing tractors for Kazakhstan, Siberia, the Volga region, the north Caucasus and other zones throughout the country). They are also employed for the production of agricultural crops based upon the use of an industrial technology.

Each year an increase takes place in the capabilities of the Khar'kov Tractor Plant. The design for the T-150KM tractor, which has a diesel power rating of 200 horsepower, was developed at the plant. These tractors are being used extensively in agricultural production. The design for this type of tractor must be improved in order to provide greater reliability and adaptability for the carrying out of agricultural technological operations and particularly plowing.

By the end of the five-year plan, the production of the DT-75S caterpillar tractor, which has a hydraulic transformer and an engine power rating of 170 horsepower, will have been mastered at the Volgograd Tractor Plant. Meanwhile, the Minsk Tractor Plant will master the production of MTZ tractors with their power rating of 100 horsepower. This plant will supply agriculture with row crop tractors: for rice production -- the MTZ-82R tractor, for cotton production (for both narrow and wide inter-row spacings) -- the MTZ-100Kh tractor and a tractor having automatic stabilization of the frame on steep slopes -- the MTZ-82K tractor.

At the present time, in domestic tractor construction just as throughout the world as a whole, a trend is being observed towards increased power for agricultural tractors. During the Eleventh Five-Year Plan, the average power rating for tractors will be raised to 98 horsepower, compared to 82 during the 1976-1980 period and 70 horsepower during the Ninth Five-Year Plan.

For the carrying out of work on plant breeding plots, the Kutais Miniature Tractor Plant is mastering the production of engine blocks having a power rating of 5-7 horsepower, miniature tractors of the 0.2 ton class having a power rating of 10-12 horsepower and also a set of machines and implements for use with them. These machines will be made available for extensive use in private orchards and gardens, on school tracts, for the harvesting of grasses in wooded areas and for other types of weakly mechanized agricultural operations.

During the Eleventh Five-Year Plan, the kolkhozes and sovkhozes will be supplied more completely with agricultural machines and implements and a grouping of machines: for the powerful T-150K and K-701 tractors, for anti-erosion work and for carrying out work associated with industrial technologies.

The production volume for the principal and traditional soil cultivation machines -- plows of various types and for various purposes, shallow plows, harrows and cultivators -- will conform to the delivery volumes for tractors and this will make it possible to satisfy more completely the agricultural requirements for these machines. For the non-traditional soil cultivation technologies, basically new soil working machines are being created -- swivel plows for 3 and 4 ton-force tractors, machines for cultivating solonetz soils, a multiple-purpose unit for the principal and per-sowing cultivation of soil, for operation with the K-701 tractor. A special implement for deep loosening and for the simultaneous application of mineral fertilizers is being developed for this tractor.

A unit for the simultaneous loosening, levelling off and packing of soil is being prepared for production. The carrying out of several technological operations during one pass by a tractor serves to promote an improvement in the efficiency of use of the more widespread 3 ton-force plowing tractors and a savings in the use of power resources.

Non-mouldboard soil cultivation has proven to be a highly effective technology in the country's large grain regions. Over the past 10 years, the area of land worked using this method has been increased by a factor of almost 4 and has reached 45 million hectares.

The development of the non-mouldboard soil cultivation method serves as a good example of close collaboration between the scientists, designers and production workers. It is presently being employed extensively by the large agricultural regions -- northern Kazakhstan, the area along the left bank of the Volga, the Altay and other regions.

For the further introduction of this method, an increase is taking place in the machines and implements required, as shown in Table 3.

For all practical purposes, the agricultural requirements for anti-erosion machines will be satisfied completely during the Eleventh Five-Year Plan.

Table 3

(in thousands of units)

	1976-1980	1981-1985
Cultivator-sweeps and deep rippers (KPG-250; KPG-2-250; KPG-2.2)	118.0	200
Cultivator-sweeps (KPP-2.2; KPSh-9; KPSh-5)	45.2	89
Anti-erosion cultivators (KPE-3.8)	62.1	85
Needle-shaped harrows (BIG-3)	150.0	350
Cultivator-seeders, shallow plow seeders and press seeders (SZS-2.1; SZP-3.6; LDS-6)	326.2	497
Multipurpose couplings (SP-16; SP-20)	134.4	215

In equipping the kolkhozes and sovkhozes, a great amount of attention is being given to grain production machines. Over a period of 5 years, 600,000 grain harvesting combines will be supplied, including 260,000 of the Kolos and Sibiryak types, which have a capability of 6.9-9 kilograms per second, and 340,000 of the Niva class, which has a capability of 5-6.5 kilograms per second. In addition, 220,000 grain harvesting combines having straw grinders will be produced.

During the past few years, the former leading branch of agricultural machine building -- combine construction -- has lost its leading positions. The rural areas are now beginning to be supplied with combines which structurally are incomplete, which are not very well suited for harvesting high-yielding grain crops and which tolerate great losses in grain. Following criticism in this regard, the Ministry of Tractor and Agricultural Machine Building developed measures for solving the more important problems of combine construction, including modernization of the Sibiryak SKD-6 grain harvesting combine, which will have a productivity of 6.3 kilograms per second and which will be employed in Kazakhstan, Siberia and other regions throughout the country. The modernized Sibiryak grain harvesting combines are already participating in the 1981 harvest. The Rostov Rostsel'mash [Rostov Agricultural Machinery Plant] Plant has commenced the modernization of the Niva combine. However, owing to the poor design for these grain harvesting machines, it will be impossible to ensure a considerable increase in the productivity, the quality of the harvesting work or in the threshing of the grain crops. Thus a new stage in combine construction will be that of developing and introducing a rotary type grain harvesting combine into agricultural production, in which use is made of a basically new system for the threshing and separation of the grain. These combines will be equipped with hydrostatic organs of control and the design of the cutting unit of the grain harvester will be improved. The productivity of the rotary type combine will be 10-12 kilograms per second, with a subsequent increase to 14 kilograms per second. At the same time, this combine will be supplied with harvesters of varying cutting widths and with multi-row corn harvesters. The design for such combines calls for the extensive use of electronic units for ensuring maximum control over the combine's operating regime. The use of this combine will reduce grain losses during the harvesting and threshing processes to roughly 1 percent and through the use of an automatic and remote control lubrication system it will lower labor expenditures for technical servicing work to a minimum.

Prior to the end of the Eleventh Five-Year Plan, assuming proper observance of the normative periods for the writing off of agricultural equipment, the pool of grain harvesting machines may reach approximately 1 million units and be capable of carrying out the harvesting operations in keeping with the established agrotechnical schedules.

Similar to tractors, the grain harvesting combines describe the technical level of equipping of agriculture. Meanwhile, a trend has been observed in recent years, in a number of union republics, towards the writing off of grain harvesting combines ahead-of-schedule: in 1979 -- 11,600 over and above the norm, including in the RSFSR -- 6,800, the Kazakh SSR -- 3,300 and the Lithuanian SSR -- 1,530. The writing off of the combines reached 15 percent, compared to 10 percent in past years. Grain harvesting combines are being written off in excess of the established norms in the BSSR, GSSR and AzSSR, despite the fact that the USSR Goskomsel'khoztekhnika system has a powerful repair base at its disposal for correcting complicated equipment break-downs.

Prior to the end of the five-year plan, industry will produce the following: a group of windrow harvesters -- tractor-mounted, single-section with a cut of 10-12 meters, which double-up on the drill rows and self-propelled -- in sufficient quantities for satisfying the agricultural requirements for them; sowing machines of new designs -- grain and mineral fertilizer, wide-swath with dosed applications of seed and fertilizers and also grain and mineral fertilizer sowing machines for the simultaneous application, together with the sowing of the grain, of a complete norm of mineral fertilizer; machines and complexes constituting grain cleaning and drying complexes and lines for the post harvest treatment and drying of grain, the quantity of which has increased by more than a factor of three over the past 10 years. Whereas during the Tenth Five-Year Plan the total amount of hourly productivity for these complexes equalled 234,400 tons, during the Eleventh Five-Year Plan it will reach 505,000 tons. A considerable increase will take place in the production of lines for the treatment and drying of seed. For the very first time, a line will appear having a productivity of 0.5 and 1-2 tons per hour for the cleaning and drying of grass seed and also attachments for the threshing of ears of corn having a productivity of 10 and 30 tons per hour.

The production of grain cleaning and grain cleaning and drying complexes having a productivity of 50 and 100 tons per hour is being mastered for the purpose of further raising labor productivity and achieving more complete mechanization of the grain economy. Overall, the five-year plan calls for 1.3 times more machines and equipment to be produced for the cultivation of grain crops than were produced during the Tenth Five-Year Plan.

The country's kolkhozes and sovkhozes will make extensive use of an industrial technology in cultivating and harvesting their various agricultural crops. Thus, self-propelled six-row corn harvesting KSK-6 combines will be supplied for harvesting corn, following use of an industrial technology for cultivating it. Their proportion in production operations will amount to 60 percent.

For the cultivation of sugar beets in the Ukraine, the Russian Federation and Moldavia, with use being made of an industrial technology that is based upon the us of single-shoot seed, herbicides, powerful harvesting equipment and mechanized loading and transporting, the plans call for the delivery of 70,000 beet sowing machines, 70,000 cultivators, 54,300 self-propelled beet harvesting combines and up to 15,000 highly productive loaders. For transporting the sugar beets, use will be made mainly of highly productive motor vehicle trains produced by the Kama Motor Vehicle Plant.

For the production of cotton, the plans call for the manufacturing of 60,000 cotton harvesting machines for varying numbers of rows, including 18,000 4-row KhN-3.6 machines and also for the production of cotton harvesting machines for the harvesting of fine-fibred varieties. For the very first time, self-propelled cotton harvesting machines will make an appearance out on the cotton fields. Increases will take place in the production of cotton pickers and stubble stump pullers, including wide-swath thrashed heap cleaners and cotton loaders. Plowing by stages is especially effective in the cotton growing zone and thus for this purpose triple and quadruple-base double-level plows and PTH-3-40 plows will be produced for triple-level plowing.

The task of further solving the problem of mechanized cotton production will be dependent to a considerable degree upon solving the problems associated with modernization of the Tashkent Tractor Plant and converting it over to the production of various modifications of the MTZ type tractor, modifications which satisfy the agricultural requirements of Central Asia and Kazakhstan for powerful tractors for cotton production and for ensuring that this zone is provided with internally produced general purpose row crop tractors. This would make it possible to release a considerable number of railroad freight cars being used at the present time for transporting tractors from the Minsk Tractor Plant to Central Asia.

The Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up To 1990 call for agriculture to be supplied with no less than 115 million tons of mineral fertilizers, in conventional units (26.7 million in a conversion for a 100 percent nutrient content), by 1985. For the efficient use of mineral fertilizers and their timely applications to the soil, the kolkhozes, sovkhozes and agrochemical associations will be supplied with machines of varying productivities. The plans call for 335,000 machines to be produced for these purposes during the 1981-1985 period, including such highly productive machines as: RUM-8 and RUM-16 (8 and 16 tons) -- 48,000, and the I-RMG-4 and RUM-5 -- 168,000 and to increase the production of machines used for applying pulverized fertilizers.

The design organizations are presently developing a complex of machines for the transporting, preparation and application of ZhKU [zhidkoye kompleksnoye udobreniye; liquid all-round fertilizer] and a complex of machines is being made available for applying liquid ammonia. For the more efficient use of machines employed for applying mineral fertilizers, an expansion is taking place in the production of mixer-loaders, mineral fertilizer mixing units, unpackaging units, sowing machine loaders and agricultural aircraft.

A strong reserve for raising the cropping power of agricultural crops is that of expanding the use of organic fertilizers.

At the present time, the annual volumes for applying them to the soil amount to approximately 900 million tons and in the near future this will be increased to 1-1.2 billion tons. However, there are times when it is not possible to use organic fertilizers on the farms owing to a lack of machines.

During the 1981-1985 period, 366,500 machines of various types will be produced. In the process, the Ministry of Machine Building for Animal Husbandry and Fodder Production plans to produce machines having great load carrying capabilities -- 10-12 tons, 16 and 22-24 tons. For the very first time, the plans call for enterprises of the newly created Sel'khozkhimiya system to be supplied with highly productive excavators, required for extracting peat and for handling fertilizers at large animal husbandry complexes.

Potato production continues to be one of the most labor-consuming branches of agriculture. During the new five-year plan, a considerable increase will take place in the production of machines and equipment used in the mechanization of all potato production processes. The kolkhozes and sovkhozes were fully supplied with potato planters, potato harvesting combines, potato diggers, mobile and stationary potato grading stations, conveyer lines and so forth. Labor productivity in the planting of potatoes will we raised substantially during the new five-year plan; the plans call for the production of 6-row and 4-row potato planters, which will be loaded from dump trucks and transport trailers and SAYa-4 planters for the planting of sprouting potatoes. For the potato harvesting work, the plans call for agriculture to be supplied with 62,300 potato harvesting combines. In connection with the production of machines for potato production operations, a requirement exists for improving their reliability and quality such that potato losses during the harvest work will be reduced.

More equipment is being made available for the production of flax, hemp, sunflowers, soybeans and other crops. A broad assortment of machines will be produced for the cultivation and harvesting of vegetables outdoors and mechanized lines for the processing of table root crops, head cabbage and onions. During the Eleventh Five-Year Plan, the vegetable growers will be supplied with 1,800 tomato harvesting combines, approximately 11,000 platforms for transporting the tomatoes, 4,200 cabbage harvesting combines and 5,000 machines for harvesting table root crops. For onion production, the plans call for the manufacturing of the following machines: for harvesting -- LKG-1.4, for processing -- PML-6 and for sorting -- SLS-7.

In recent years, great results have been achieved throughout the country in the hothouse cultivation of vegetables. Each year, more than 470 hectares of hothouse are being placed in operation in agriculture and other branches, including 250-270 hectares of winter hothouse area. USSR Goskomsel'khoztekhnika has performed a great service in connection with the construction of winter hothouses. It created special structures and technological equipment for use in the construction of hothouses. For the mechanization of large volumes of work in hothouses, various items of equipment will be produced: soil preparation equipment, cutters with varying productivities, conveyer lines, wagons, machines for the washing and packing of fruit and vegetables and mechanisms for separating out the seed from various vegetable crops.

Construction is presently underway on a specialized enterprise for the production of equipment for mushroom complexes, the construction of which will commence during the next few years in large administrative and industrial centers of the country.

For equipping the scientific research institutes and seed production stations, the Ministry of Tractor and Agricultural Machine Building, the USSR Ministry of

Agriculture and USSR Goskomsel'khoztekhnika developed structures and have commenced the production of miniature plant breeding and seed production equipment.

The stable development of animal husbandry is impossible in the absence of a feed base. A leading role in the creation of this base must be played by the machines and equipment made available for feed production and feed preparation. Although the branch of machine building for the mechanization of animal husbandry and feed production is one of the youngest, nevertheless it is developing at a high tempo compared to the other branches of machine building. During the 1981-1985 period, an increase is called for in the production of machines and equipment for feed production, as shown in Table 4.

Table 4

(in thousands of units)

	1976-1980	1981-1985
KSK-100 forage harvesting self-propelled combines	8.7	50.0
KPS-5G self-propelled mower-crushers	4.5	25.0
Tractor rakes	241.4	305.0
Pick-up balers	150.7	168.0
including PRP-1.6 roller types	5.2	30.0
IRT-165 coarse feed crusher-grinders	2.6	26.0
KUN-10 sweep rakes	128.3	174.0
Hay pick-up and stack forming units and hay wagons (STP-60, SP-60)	0.2	12.0

Based upon the data furnished, it would appear that new and more improved machines will be produced for feed production during the Eleventh Five-Year Plan, machines which will make it possible to obtain rich feed using various technologies. The forced ventilation technology will continue to occupy an important place in the production of coarse fodder. Increases will take place in the production of the KSK-100 highly productive self-propelled machines, KPKU-75 towed hay mowers, KPS-5G self-propelled mower crushers and also the E-280 and E-301 fodder harvesting machines, for the procurement of grasses for hay and haylage and for preparing granulated and briquetted feed. The deliveries of equipment for preparing grass meal and granulated and briquetted feed will be carried out in quantities which will fully satisfy the agricultural requirements.

The plans call for a further increase in the production of machines used for carrying out various types of work on large-horned cattle farms. Approximately 480,000 feed distributors will be produced, compared to only 362,300 during the Tenth Five-Year Plan, 765,000 conveyer lines for cleaning facilities and 40,000 scraper units. The requirements of the large-horned cattle farms for watering bowls, milking units and also other machines and equipment will be satisfied completely.

The kolkhozes and sovkhozes will be supplied with greater quantities of special equipment used in the initial processing of milk: cooling tanks, cleaner-coolers, cooler-receptacles and water cooling machines. This will make it possible to raise the grade of the milk and to produce better quality dairy products.

For the mechanization of operations at swine raising farms, the following equipment will be produced during the Eleventh Five-Year Plan: 60,000 feed distributors and feed distributor-mixers and 37,000 conveyer lines for cleaning facilities. In addition, an increase will take place in the production of equipment used for raising young pigs and fattening swine. The production volumes for the various types of equipment needed for this branch of animal husbandry will fully satisfy the agricultural requirements.

A broad nomenclature of machines and equipment will become available for mechanizing all of the technological processes in poultry raising. Thus the production of the more progressive triple-level batteries of cages for an industrial flock and for raising young replacement poultry stock will be increased to 8,500 units. For the raising of young replacement hens for meat purposes and also broilers, turkeys and ducks, industry will supply 15,000 sets of equipment and an increase will take place in the production of mixed feed storage containers and motorized feed wagons, including those based upon use of the KamAZ motor vehicles.

In raising the culture of production and the productivity of animal husbandry, special importance is attached to farm machines of a general purpose nature, the production of which is also being increased. For example, 192,000 heat generators will be produced, 456,000 steam-generating boilers and 760,000 electric water heaters. The plans call for production to commence on electrode steam generators having power ratings of 100, 160 and 250 kilowatts. The animal husbandrymen will be supplied with ventilation-humidifier units and water-raising units.

The principal agricultural operations at the present time -- plowing, harrowing, cultivation, sowing of grain and technical crops, interrow cultivation of potatoes, vegetables, sugar beets, cotton, harvesting of grain crops and so forth -- are fully mechanized. With each passing year, the mechanization level for work processes in animal husbandry and feed production is raised still higher. By the end of the Eleventh Five-Year Plan, based upon the planned production volumes for machines and equipment and improvements in their efficient utilization, the mechanization level for many power-consuming agricultural operations will have been raised (see Table 5).

Table 5

(in percent of overall volume)

	1979	1985
Planting of vegetable crops	58	80
Post-harvest processing of grain on flow lines	72	90
Harvesting:		
of sugar beets by combines	92	100
of cotton by machines	53	80
of flax by combines	72	85
of potatoes by machines	92	97

The mechanization level for such agricultural operations as the harvesting of vegetables, tea, hops and so forth will be raised.

The work of supplying the farms and labor in feed production with equipment will serve to ensure that the level of mechanized operations for the issuing of feed on large-horned cattle farms will be raised to 65 percent, on swine raising farms -- to 85 percent and the work of cleaning facilities on large-horned cattle farms -- to 80 percent and on swine raising farms to 90 percent, prior to the end of the five-year plan.

The plans call for the modernization and expansion of 10 tractor plants and also many plants of agricultural machine building.

Many enterprises of the Ministry of Machine Building for Animal Husbandry and Fodder Production will be expanded and modernized or built anew: Gomel' and Mogilev agricultural machine building, Orekhov agricultural machine building in Zaporozhskaya Oblast for the production of feed distributors and mixers, the Nezhin imeni 60-Letiya Velikoy Oktyabr'skoy Sotsialisticheskoy Revolyutsii and the Pyatigorsk agricultural machine building imeni S.M. Kirov for the production of machines and equipment for poultry raising and so forth.

One of the most important conditions for stable development of agricultural production is that of extensive and comprehensive use of electric power.

At the present time, the electrification of all kolkhozes, sovkhozes and other agricultural enterprises has been fully completed.

The power-worker ratio per individual worker in agriculture in 1975 was 2,290 kilowatt hours, in 1980 -- 3,577 and by 1985 it will reach 5,688 kilowatt hours.

The equipping of agriculture with modern means of mechanization will promote further improvements in the efficiency of agricultural production and the successful solving of economic and social tasks during the Eleventh Five-Year Plan.

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AGRO-ECONOMICS AND ORGANIZATION

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UDMURT ASSR PRIVATE PLOT POTENTIAL UNDERDEVELOPED

Sverdlovsk URAL'SKIYE NIVY in Russian No 8, Aug 81 pp 30-32

[Article by K. Tyurev, assistant professor and head of the Department of Political Economics at Udmurt University: "Daily Attention for the Private Plots"]

[Text] The production level achieved in the public economy still does not satisfy the country's requirements for agricultural products. Sufficient use is still not being made of the potential offered by the private plots and indeed they can provide a substantial increase to the country's food supply. In 1977, for example, 59 percent of the potatoes, 29 percent of the vegetables, 28 percent of the meat, the same percentage of milk and 35 percent of the eggs were produced on the country's private plots.

Thus the January 1981 decree of the CC CPSU and the USSR Council of Ministers entitled "Additional Measures for Increasing the Production of Agricultural Products on the Private Plots of Citizens" came as no surprise. It contains the statements: "By no means is full use being made of the potential afforded by the private plots of citizens for increasing the production of meat, milk and other products. The party, soviet and economic organs in a number of oblasts are not attaching proper importance to the role being played by the private plots of citizens."

This situation applies to the Udmurtskaya ASSR. During the past few years, the number of livestock on the republic's private plots has decreased. During the 1976-1978 period, the number of large-horned cattle decreased by 44.2 percent compared to the figure for 1957-1959, including a reduction in cows -- of 36.8 percent and in sheep and goats -- 42.5 percent. The increase in the number of public livestock of all types did not compensate for the overall reduction in livestock throughout the republic. At the end of 1978, there were 611,600 head of KRS [krupnyy rogatyy skot; large-horned cattle] in the Udmurtskaya ASSR, of which number 79,800 were in the private sector, compared to 149,400 head in 1958.

Certainly, it is impossible to increase the number of livestock in the private sector to the 1958 level, since the republic's rural population has declined by almost 30 percent. However, an increase in the herd of animals on the private plots is fully possible. Here are our calculations in this regard. In conformity with the Model Regulations for a kolkhoz, a kolkhoz family (kolkhoz farmyard) can have a cow with offspring up to 1 year of age, one head of large-horned cattle up to 2 years of age, a sow with offspring up to 3 months of age or two swine for fattening and also up to ten sheep and goats, bee colonies, poultry and rabbits. When one bears in mind that there are presently approximately 60,000 kolkhoz farmsteads and almost 89,000 plots belonging to other categories of rural residents, then it is not difficult to determine the number of livestock. Thus the private sector is capable of producing additionally 40,000-45,000 tons of meat of all types (live weight), 130,000-140,000 tons of milk, 60-70 million eggs and 250-300 tons of wool. But this is not happening and the kolkhozes and sovkhozes will not be able to compensate for this shortfall in the near future, owing mainly to the fact that they lack the required number of good quality mechanized facilities and also because the labor productivity and livestock productivity at the old farms are low.

The development of the private plots will draw into the work areas a considerable portion of that part of the population which is not participating in public production. At the beginning of 1980, at kolkhozes in the Udmurtskaya ASSR alone, there were 37,200 pensioners and 24,200 juveniles ranging in age from 12 to 16 years of age. Certainly, this category of personnel cannot be drawn into public production. However, a definite portion of the pensioners, juveniles and even children are capable of performing work on the private plots. Indeed, youngsters are fully capable of driving a herd of domestic cattle, meeting them following their grazing, turning over and raking hay during mowing operations and carrying out other light domestic tasks. Yes and one must also consider the educational aspect. Journalist V. Peskov was correct when he wrote in KOMSOMOL'SKAYA PRAVDA that youth will not hurry to work on a public farm if they have not first smelled farmyard manure on their own farmsteads. The facts speak for themselves: at those kolkhozes and sovkhozes where attention is given to the private sector, there is less migration of the population to cities.

At the present time, the rural population in the Udmurtskaya ASSR of non-able bodied age (pensioners, juveniles) and also housewives numbers approximately 250,000 individuals. And if 60-70 percent of this figure works on private plots, a great amount of work can be carried out.

But the private plots require assistance and mainly in the form of feed. This can be accomplished through the development of additional land tracts and such land is available in every oblast in the Urals economic region. In the Udmurtskaya ASSR, for example, there are 22,400 hectares of swampy land, 9,900 hectares of waterlogged land, 80,400 hectares of land that is overgrown with bushes and small trees and 682,600 hectares of land that is susceptible to erosion. It is possible at the present time to obtain coarse feed from a considerable portion of these areas without great expenditures. Another reserve is that of empty land that has become available following the elimination of so-called unpromising settlements which, compared to 1960, have decreased in number by more than 1,000. The development of these areas, the elimination of unnecessary roads and also the plowing up of roadsides will increase the republic's land potential. At the same time, use can be made of other potential that is available for increasing feed procurements. The Udmurtskaya ASSR and Chelyabinskaya, Permskaya, Sverdlovskaya Oblasts are distinguished by broken terrain containing many small haying tracts on which it is impossible to employ large items of equipment. However, the leaders of some kolkhozes and sovkhozes, for various reasons, are not allowing hay to be procured from these tracts and thus the land often remains unharvested.

First of all, it will be necessary to create a strong feed base for public animal husbandry, for only if this is done will it become possible to allocate meadow and pasture lands and feed for the private sector. But feed production is still being carried out in a primitive manner at many kolkhozes and sovkhozes. Here, moreso than in other branches, modern technologies and the achievements of scientific-technical progress are being introduced into operations more slowly. This was mentioned by L.I. Brezhnev during the July (1978) Plenum of the CC CPSU.and it applies fully to the Udmurtskaya ASSR. A large amount of manual labor is being employed for the cultivation and harvesting of forage crops, with a portion of these crops not even being harvested from year to year. In short, feed production is viewed as a matter of secondary concern, with the farm leaders and agricultural services devoting a maximum amount of attention to cultivation of the grain crops. This is correct. But the time is at hand for converting feed production into an independent branch and for evaluating it based upon the final results achieved by animal husbandry. Then the leaders and specialists will devote greater attention to the production of feed and this will force them into searching for and introducing into operations all available reserves and all of the leading and progressive methods for feed production that have accumulated throughout the country.

Concern must also be displayed for supplying the rural residents with young livestock. The complexity of this problem, as explained by a number of kolkhoz and sovkhoz leaders, lies in the fact that many farms are fulfilling their annual plans for increasing the numbers of all types of animals under great stress and at times the plans are even being disrupted. Moreover, some sovkhozes and kolkhozes are even turning to the local population for assistance. For example, during the past few years they have procured up to 12,000-17,000 head of large-horned cattle from local villagers. A closed circle is forming: the kolkhozes and sovkhozes are unable to sell animals to their workers, since they do not have enough on their farms and they are not procuring cattle from the population in the required numbers. But reserves are available here. First of all, the barrenness of the cows must be reduced to a minimum, the proportion of which in recent years has amounted to 17-19 percent of their overall number. Secondly, improvements must be achieved in the fruitfulness of other animals. Within the republic, the annual number of new-born lambs per 100 ewes does not exceed 76-95 head, 100 sows produce from 1,200-1,400 suckling pigs and these figures are low. A campaign must also be waged against livestock losses. During the 1975-1979 period, the average annual losses compared to the overall turnover of the herd were as follows: large-horned cattle -- 3.3 percent, swine -- 6.4 percent and sheep -- 6.4 percent.

It cannot be said that the private plots are not receiving assistance. For example, 80,000-110,000 young pigs are being sold annually to satisfy the needs of the private sector and yet a greater quantity is required. It is obvious that special swine, sheep and rabbit farms should ideally be created for meeting the requirements of the private plots.

The kolkhoz and sovkhoz leaders play a major role in the development of the private plots. Thoughtful and enterprising administrators are well aware of this fact. For example, nine young families at the Pravda Kolkhoz in Uvinskiy Rayon (Chairman M.I. Smetanina) requested that they be supplied with cows and within a short period of time their request was granted. The administration of the Kolkhoz imeni Kirov in Balezinskiy Rayon (Chairman Yu.I. Korepanov) and the leaders of other farms also display concern for their kolkhoz families.

In 1979, at the above-mentioned Pravda Kolkhoz, the kolkhoz families having cows supplied the procurement organizations with 600-800 liters of milk. At the kolkhozes imeni Kirov, imeni Michurin and Put' k kommunizmu in Balezinskiy Rayon, the private sector sells considerable quantities of meat, wool and eggs.

In focusing attention on the need for developing the private economy, thought should also be given to easing the work of the rural residents. This can be promoted through the introduction of light equipment: miniature low-power tractors, self-propelled undercarriages or field wagons, portable electric milking units, mowers and sprayers, towing and mounting implements, domestic water pumps, straw-cutters and feed grinders. Nor should the use of horse-drawn equipment be overlooked, since this still represents an important means for carrying out work on the private plots.

All of these measures are called for in the directive documents of the party and government. Thus they must be carried out in a spirited rather than a formal manner, particularly in view of the fact that they are directed towards improving the welfare of all Soviet people.

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AGRO-ECONOMICS AND ORGANIZATION

FRUIT, VEGETABLE SUPPLY PROBLEMS IN BELORUSSIA

Moscow SEL'SKOYE KHOZYAYSTVO BELORUSSII in Russian No 9, Sep 81 pp 4-5

[Article by N. S. Yakushev, minister of fruit and vegetable industry, Belorussian SSR, under rubric "Agroindustrial Complex: Prospects for Development : The Republic's Fruit and Vegetable Shop"]

[Text] The Communist Party and the Soviet government show daily concern for the welfare of the nation and for the raising of the national standard of living. Brilliant confirmation of this is provided by the historic decisions of the 26th CPSU Congress. The improvement of the supplying of Soviet citizens with foodstuffs is one of the major tasks which must be resolved by our economy within the next few years.

Within the shortest periods of time the labor collectives in the system of the Belorussian SSR Ministry of Fruit and Vegetable Industry, will have to improve the supplying to the republic's population of vegetables, fruits, berries, potatoes, and products resulting from the processing of them. This must be assured by increasing their production, eliminating losses, and organizing efficient and well-coordinated work at all enterprises and organizations that are engaged in growing, procuring, processing, storing, shipping, and selling this produce. As part of our ministry there have been created seven agroindustrial associations involved in fruit and vegetable production (*oblplodoovoshch*) and the republic-level Orchard-Growing Trust. In order to provide the population of the city of Minsk with fruits, vegetables, and potatoes, the Minsk Cost-Accounting Agroindustrial Association for Fruit and Vegetable Production ("Volma") has been created.

The agroindustrial associations and the republic-level Orchard-Growing Trust include 132 sovkhozes, 23 wine-making, 11 alcoholic-beverage, 43 canned-goods, six vegetable-drying, and two starch plants, 20 city-level fruit and vegetable *torg*'s [trade organizations], nine enterprises in retail-wholesale trade, and six wholesale-retail fruit and vegetable combines in the city of Minsk. In the cities of Beloozersk, Novolukoml', and Vileyka, sovkhoz company stores are in operation, and in Klimovichi, Mstislavl', Osipovichi, and Bykhov, retail-trade enterprises that are subordinate to the closely situated organizations in the fruit and vegetable management. The total number of organizations in operation is: 336 stores; 183 potato, vegetable, and fruit storage facilities with a capacity of 277,000 tons of storage at any one time; 51 fermentation and pickling points, with a capacity of 19,000 tons; and other structures. The Special Technological-Design Bureau, with the experimental production of the BSSR Ministry of Trade system, has been transferred to our ministry.

As a component part of the republic's agroindustrial complex, the ministry has been called upon to carry out a uniform policy in the area of the production, procurement, processing, storage, and sale of fruit and vegetable output; to monitor the fulfillment of the plans for the organization of a republic-level fund and the receipts of this output by import; to conduct wholesale-retail trade in fruits and vegetables; to sell them through a specialized network of stores; and to manage efficiently the commercial resources in the republic and the oblasts.

There has been a large amount of work to organize the subordinate structural subdivisions, to select and assign personnel, and to eliminate the departmental dissociation in the agroindustrial associations that have been created. From the first days of operation, we have had to devote our main attention on questions of deepening the specialization and concentration, on achieving a major buildup in the level of production of fruit and vegetable output. During the current year the specialized sovkhozes are supposed to produce no less than 380,000 tons of vegetables and guarantee the sale of them in the quantity of 306,000 tons, which is 28 percent more than was sold annually, on the average, during the Tenth Five-Year Plan.

Much has already been done to cope successfully with the task that has been assigned. Plantings of vegetables have been expanded everywhere on irrigated land and in plastic-film shelters; specialized vegetable-growing brigades and teams have been created; and the variety of vegetable, especially salad crops, has been expanded. The psychological and material incentive of the vegetable-growers has been increased. All these things have made it possible to increase considerably the sale of early vegetables to the public. During the first seven months of 1981, their sale increased by 37 percent and came to 68,000 tons. There was expanded sale of cucumbers, tomatoes, parsley, celery, and squash, and twice as many early potatoes were sold.

Good experience in the development of vegetable-growing has been accumulated by the vegetable-growers in the Mogilevskoye Agroindustrial Association. There, thanks to the large amount of assistance and attention on the part of the party and Soviet agencies, a definite amount of work was carried to achieve the interfarm and intrafarm specialization of vegetable-growing, the introduction of progressive technological measures, the creation of vegetable crop rotations on irrigated land, and the construction of mobile "tomato plots" and modern hothouse combines. These measures made it possible to raise the level of mechanization of vegetable cultivation, and to reduce to the minimum the dependence that production has upon unfavorable climatic conditions. For example, the "Veynyanskiy Teplichnyy Kombinat" and "Goretskiy" Sovkhozes and the "Mogilevskiy" Hothouse Combine, during recent years, have annually been producing steady cabbage harvests within the limits of 350-400 quintals per hectare; carrots, as many as 350; and table beets, more than 250 quintals. The broad introduction of mobile plastic-film shelters on tomato plantations makes it possible under any conditions to obtain stable harvests. During the current year the production of tomatoes will be approximately 1600 tons. The experience of the Mogilev vegetable-growers was broadly studied and considered by all the specialists in the ministry's system at a republic-level seminar that was held here.

The higher level of production of vegetables made it possible during the current year to achieve a major increase in the share of local raw materials for the canning and vegetable-drying enterprises.

The absolute majority of the plants in the ministry's system overfulfilled the program for the first seven months. They produced 11.6 million standard cans of canned goods in excess of plan. The growth rate, as compared with the corresponding period last year, was 110.3 percent. Special attention was devoted to producing output for which there is increased demand. The plan for production of canned and marinated cucumbers was doubly overfulfilled; tomatoes, by a factor of 2.6; canned squash, by 110 percent; and fruit and berry juices, by 120 percent.

Of course, it would be incorrect to think that the unification of various departments and branches engaged in growing, procuring, processing, and selling fruit and vegetable output, in and of itself, removes all the problems on the fruit and vegetable conveyor belt. A large number of unresolved questions remain on the agenda, the chief one being the guaranteeing of a reliable, guaranteed, and constantly growing level of production.

In addition to overcoming the major shortcomings in the activity of the farms that are within the ministry system, it will be necessary to resolve a number of major, cardinal questions of an organizational and technological nature. During the current five-year plan it will be necessary to expand the volumes of reclamation and irrigation operations in order to place all the vegetable plantations on irrigated land (at the present time only 57 percent of vegetable crops are grown on irrigated land). It will be necessary on all farms to deepen the specialization and concentration of production, to create powerful vegetable zones around major cities, to introduce vegetable crop rotations everywhere with progressive technological measures for cultivating the crops, and to achieve a fundamental improvement in their seed production. It will be necessary to devote more attention to expanding the areas of protected soil, to the building of hothouse combines and plastic-film hothouses. Major assistance in this matter can be provided by the industrial enterprises and organizations.

Modern vegetable-growing on large-scale specialized farms would be inconceivable without complete mechanization. Unfortunately, the republic's vegetable-growers do not have a sufficient amount of technology for sowing or taking care of the crops, and there are no machines for bringing in the harvest. We have been forced to bring in people from industrial enterprises and educational institutions. All this, of course, leads to large losses in social production. Life persistently demands the most rapid resolution of this problem. Promptness in carrying out these and other measures will make it possible to improve considerably the supplying of the public with fruits and vegetables to the extent that, by 1985, the consumption of vegetables per capita of population will be as much as 92 kilograms.

A major task is confronting the ministry as a result of the increase in the production of fruits and berries in the republic. The underestimation of that task in recent years gave rise to the problem of planting material, and restrained the creation of new, modern, highly productive orchards and berry fields of the industrial type. We shall have to revive the network of nurseries and assure the production of planting material in volumes that are required for the repairing of existing industrial and subsidiary orchards, and the planting of new ones. We shall soon see the completion of the elaboration of the general plan for the development of industrial fruit-growing in the republic, which has been computed for the period up until the year 2000. The industrial planting of orchards and berry fields will be carried out in accordance with previously developed plans, with a consideration of the latest achievements of production technology, commercial handling, storage, and the processing of fruits and berries.

One peculiarity of industrial orchard-growing is the planting of intensive-type orchards -- those with a freely growing crown, which does not require a complicated formation, and with the compact placement of the trees.

During the Eleventh Five-Year Plan the farms in the ministry's system are required to plant approximately 6000 hectares of fruit and berry plants. Steps are being taken to expand the production of seedlings. Six fruit-nurseries have been created within the ministry's system; they are already selling some of the commercial output (seedlings of fruit trees, berry bushes, and strawberry plants). By the end of the five-year plan we plan to satisfy completely the needs of the kolkhozes, sovkhozes, orchard-growing associations, and the public with regard to planting materials for growing fruits and berries.

Much will have to be done to improve the preservation rate for the harvest of fruits, vegetables, and berries that have been grown. We might as well confess that a large amount of produce continues to spoil en route between the field and the customer. The customers are completely justified in making reproachful remarks about the unattractive appearance of the produce that arrives in the stores. We are taking steps to improve the planning and delivery of produce to the store shelves. We are building acceptance and turnover stations on sovkhozes. Motor transport is being used more efficiently. We are expanding the deliveries of vegetables according to the "field to store" system. We are organizing the sale of produce at vegetable fairs, bazaars, and through an additionally organized small-retail trade network (pavilions, kiosks, vendor's trays). The residents of Minsk, Gomel', Mogilev, and other cities in the republic have given good grades to the vegetable fairs and bazaars that operate on days off. This form of trade will be expanded in the future.

One can still sense the departmental barriers that formed in the past between the branches which currently have been combined into the ministry's system. There is a lack of one's own technological transport; packaging management has not yet been set right; and there is a shortage of storage facilities for which the temperature conditions can be regulated. The ministry is applying efforts to resolve these problems within the current five-year plan.

In addition to improving the supplying of the republic's public with fruits and vegetables in fresh form, we must considerably improve the supplying of them with products resulting from the processing of the fruits and vegetables. The production of canned goods during the five-year plan is supposed by increase by 11 percent, including a four-fold increase in the production of canned baby food. The vegetable-drying enterprises are supposed to increase the production of dried vegetables and potatoes by 45 percent. In order to increase the production of products that are ready to eat, as well as partially prepared products made from potatoes, fresh-frozen fruits and vegetables, and baby food, it will be necessary to carry out a large volume of work involving the technical remodeling of the processing enterprises. That problem should have been resolved long ago.

At the present time the farms have grown a rather good harvest of fruits and vegetables. The task of the workers in the fruit and vegetable agroindustrial complex is, in an organized and efficient manner, to carry out the procurement of the harvest, the skillful placement of the output in storage, and the guaranteeing of the mass processing of it at the enterprises. The procurement of the output at the public's orchards and vegetable plots is proceeding at full speed. The organizations in our ministry's system are applying efforts to provide the public with fruits, vegetables, and potatoes for the entire period between seasons.

The workers at sovkhozes, enterprises, and organizations of the Belorussian SSR Ministry of Fruit and Vegetable Industry, will apply all their efforts to make a worthy contribution to carrying out the foodstuffs program and to fulfill with distinction the decisions of the 26th CPSU Congress and the 29th Congress of the Communist Party of Belorussia.

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TILLING AND CROPPING TECHNOLOGY

MEASURES FOR RAISING CROPPING POWER OF MILLET IN AKTYUBINSKAYA OBLAST

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 22 May 81 p 2

[Article by I. Tsygankov, candidate of agricultural sciences and head of the Department of Plant Breeding and Primary Seed Production at the Aktyubinskaya Oblast Agricultural Experimental Station, Aktyubinskaya Oblast: "Attention for the Groat Crop Fields"]

> [Text] The farmers in Aktyubinskaya Oblast are engaged in sowing their millet crop. This year the sovkhozes and kolkhozes are planting this valuable groat crop on 144,000 hectares. In response to the decree of the CC CPSU and the USSR Council of Ministers entitled "Additional Measures for Stimulating the Production and Procurements of the Grain of Buckwheat, Millet, Beans and Lentils," the oblast's agricultural workers have vowed to sell no less than 60,000 tons of millet to the state.

Millet is the leading groat crop in Aktyubinskaya Oblast. In recent years the farm leaders and specialists have begun to devote greater attention to it. As a result, some growth has been achieved in the production and deliveries of this grain. The farms in Komsomol'skiy, Aktyubinskiy, Alginskiy, Isatayskiy, Uilskiy and Khobdinskiy Rayons have become large suppliers of millet.

A definite amount of experience in the cultivation of millet has been accumulated throughout the oblast. Thus, last year and the year before, yields of from 15 to 23 quintals were obtained at the kolkhozes imeni Kirov, Dobrovolets and Peredovik and at the Sovkhoz 40 Let Kazakhskoy SSR, on areas of from 300 to 1,000 hectares. The experience of farms in the southern zone warrants attention. Some of them, such as the sovkhozes Akrabskiy and Kiil'skiy, are obtaining 8-11 quintals of grain per hectare.

Neverhteless, the millet yields remain low for the oblast as a whole. The principal reason -- low level of agricultural practices. This is borne out by data on millet yields obtained at strain testing stations and on farms. As a rule, the grain yields obtained at strain testing stations are 4-6 quintals higher than those obtained at farms.

A considerable amount of work was carried out this year in connection with increasing the production of millet. Special attention was given to the selection of the predecessor crops. The kolkhozes and sovkhozes are using tracts of land for this crop on which autumn plowing of the soil was carried out using deep rippers, or fallow fields or virgin land was plowed up. These predecessor arrangements alone can satisfy the millet requirements in terms of the amount of productive moisture in the root layer of soil and also in terms of its compactness. More strict control is being exercised over the sowing periods, the sowing norm and also over the pre-sowing tilling of the soil. The task has been assigned of ensuring that the soil in all areas is thoroughly prepared, levelled off properly, a maximum amount of moisture retained and the weeds destroyed.

Millet responds very well to fertilizers throughout the oblast. Last year, superphosphate or ammophos was applied to the drill rows on a large portion of the sowings at the rate of 60-70 kilograms per hectare. This year, mineral fertilizers will be applied to all of the areas sown. According to data obtained from the Aktyubinsk Experimental Station and a number of farms, fertilizers produce an increase in yield on the order of 1.5-2.5 quintals per hectare.

The millet growers are carrying out a great amount of work in connection with introducing new varieties into production. This year the Start variety, developed at the Scientific Research Institute of the Southeast, was regionalized in the oblast. Over a period of 3 years of testing at strain testing stations, it surpassed the Saratovskoye-853 variety in terms of cropping power by 1-1.5 quintals per hectare. Work is presently going forward at an experimental station and on a number of farms in connection with the accelerated propagation of the new variety, in the interest of ensuring its rapid introduction into operations on the kolkhoz and sovkhoz fields.

One decisive condition for success is proper work organization. On many farms the millet is being cultivated by mechanized teams. They are assigned land, tractors and towing equipment. They carry out all of the work during the best periods in accordance with the technological charts. Definite material stimuli have been defined for the millet growing teams and they are awarded incentives for having over-fulfilled their grain production plans. Such a principle for organizing the work serves to raise the responsibility of the machine operators and it creates interest in increasing the production of this valuable groat crop. This is readily apparent in the example of such farms as the sovkhozes imeni Dzerzhinskiy, 40 Let Kazakhskoy SSR and the Peredovik Kolkhoz. Here the teams have each been assigned 400-500 hectares of arable land. In the autumn the tracts are cultivated and levelled off and repeated snow retention work is carried out on them in the winter, thus making it possible to accumulate 50-60 additional millimeters of productive moisture. Thorough moisture retention work is carried out in the early spring using BIG-3 harrows in two tracks and Zigzag harrows in four tracks. Two cultivations are conducted prior to sowing. The sowing is carried out using SZP-3.6 sowing machines and a sowing norm of 20 kilograms of seed per hectare. The tracts are treated with herbicides during the tillering stage. The harvesting work is conducted using only the two-stage method; this improves the possibility of obtaining grain having excellent marketable qualities.

Using such a technology, the millet yields reach 15-23 quintals per hectare. The members of the teams receive an additional payment on the order of 300-500 rubles each for 10-12 quintals of grain. The team system of labor organization has been used more extensively this year. Compared to last year when 140 teams were created, this year -- 185. They have been assigned 144,000 hectares.

Mention should be made of one strong reserve that is available for raising the cropping power of millet -- irrigation. In recent years, measures have been undertaken throughout the oblast to revive irrigated millet production, originally initiated by Ch. Bersiyev. Millet was grown on irrigated tracts last year at the sovkhozes imeni Ch. Bersiyev and Kenkiyakskiy and at the kolkhozes imeni Il'ich and Parizhskaya Kommuna. The Uilskoye Beloye variety was grown on these farms. True, the average yield was not very high -- 25-35 quintals per hectare and only on individual tracts -- 45-50. However, these results already indicate that a yield of 60-70 quintals of Bersiyev millet is realistic. Thus the decision was made this year at an oblast agricultural conference to grow this millet on 1,500 irrigated hectares. Measures have been developed and approved for cultivating this crop on watered lands.

In the interest of restoring the Uilskoye Beloye variety and organizing its seed production, the selection of the largest panicles has been carried out. Seminars and agricultural instruction have been provided in the rayons and on the farms.

This year the millet growing teams will compete for the honored prize imeni Chaganak Bersiyev, instituted by the oblast party committee, the oblast executive committee and the oblsovprof [oblast council of trade unions]. The work carried out prior to the sowing campaign is giving reason to hope that the field crop growers in Aktyubinskaya Oblast will revive their former glory and fulfill their plans and obligations for the production and sale of millet to the state.

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TILLING AND CROPPING TECHNOLOGY

STATUS OF MILLET CULTIVATION IN URAL'SKAYA OBLAST SCORED

Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 22 May 81 p 2

[Article by Yu. Peshkov, Ural'skaya Oblast: "Millet in Disgrace"]

[Text] For a long period of time, a valuable groat crop -- millet -- has been grown together with grain crops in Priural'nyy Rayon. This year its sowings will occupy more than 100,000 hectares. The crop is presently being sown throughout the oblast. However, many farm leaders and specialists here do not entertain any special hope that millet will produce any benefit -- they sow it because the plan has been lowered. It is difficult to understand their attitude towards this crop. Over a period of 5 years, the oblast has fallen behind in its deliveries of millet by 216,500 tons. During some years, instead of 85,000 tons, the farms procured only 27,000-28,000 and in 1977 even less -- only 12,000 tons. At that time, only 3.1 quintals of grain were obtained from each hectare.

The low cropping power of millet is the chief reason for non-fulfillment of the plans. In 1976, 11.3 quintals were obtained per hectare, during the intervening years -- 4-8 and last year -- only 3.6 quintals.

Nevertheless, in carrying out the decrees of the CC CPSU and the USSR Council of Ministers entitled "Measures for Increasing the Production of Buckwheat and Millet Grain" and "Additional Measures for Stimulating the Production and Procurements of the Grain of Buckwheat, Millet, Beans and Lentils," adopted in 1976 and 1981, special importance is attached to Ural'skaya Oblast. Its soil-climatic conditions conform to the biological potential of the crop. There was a time when the fame of Ural'skaya Oblast millet extended far beyond the borders of the kray. For example, the millet yields in Kamenskiy Rayon amounted to a stable 14-15 quintals. Today they are not obtaining one half this amount here. Millet has gradually become one of the oblast's secondary crops. It has been excluded from the crop rotation plan. Quite often the schedules for sowing and harvesting this crop and also the agricultural practices employed for cultivating it are not followed. From good tracts of land, millet has been moved to weedy fields.

But the most acute problem today is that of seed. According to data supplied by the oblast State Seed Inspection, of 15,000 quintals of seed for this year's sowing, only 2,800 quintals are graded 1st class; the remaining amount is either 2d or 3d class and 2,100 quintals are on the whole of non-grade quality owing to weed content. Moreover, similar situations prevail with regard to seed in the chief millet growing rayons of Kamenskiy, Priural'nyy and Chingirlauskiy. What kind of yield can be expected, for example, at the Belogorskiy Sovkhoz in Chingirlauskiy Rayon where for each kilogram of millet there are 210 seeds of weed plants. And at the Voskhod Sovkhoz in Akzhaikskiy Rayon, even more -- 450 weeds.

The millet is being sown using weak seed and, even worse, on poor tracts and following poor predecessor crops. Here it is not even necessary to mention specific farms. The deputy chief of the oblast agricultural administration, B. Uskumbayev, frankly stated that no land remains in the oblast for millet. It requires clean fallow and instead of 350,000 hectares of such land in Priural'nyy Rayon, there are scarcely 200,000 and the virgin and long fallow land were long ago plowed up.

Millet occupies only six percent of the overall grain crop area and thus references to a shortage of land are not valid. Of more than 1.5 million hectares of arable land, it is always possible, providing the desire is there, to find 100,000 hectares of land that would be favorable for the growing of a groat crop. Last year, at the Kolkhoz imeni Lenin in Priural'nyy Rayon, 400 hectares of sparse sandy land were made available for millet and no yield was obtained. Even at an experimental-demonstration farm of the Ural'skaya Oblast agricultural station they decided to sow millet and the cultivated plants were choked out by the weeds. Moreover, use had been made of the new Saratovskoye-3 variety. All 20 hectares here were written off because of the "elements" and a document was presented to Gosstrakh [Main Administration of State Insurance] requesting compensation for the losses sustained. And this variety should have been regionalized this year.

Strain changing is being carried out very slowly in the oblast. The same Saratovskoye-853 millet has been under cultivation for dozens of years. It is a valuable variety and yet there are others that are more productive.

The plant breeders developed the local Ural'skoye-109 variety of millet, which was regionalized this year. However, it has been sown only on a small area owing to a shortage of seed.

The creator of the variety, the former senior scientific worker of the Department of Plant Breeding of the oblast agricultural experimental station and honored agronomist of the Kazakh SSR, S. Tarasov, stated:

"The fate of the Ural'sk millet is indeed sad. Quite often, instead of grain only wild oats is obtained. On a majority of the farms, the groat crop is sown only for report purposes."

What must be done in order to correct the situation? First of all, there must be no millet sown on fields that are overgrown with wild oats. The state plan must be fulfilled not by expanding the areas but rather by increasing the cropping power of each hectare and this will require the specialization of individual farms in the cultivation of this crop. The directors of sovkhozes, kolkhoz chairmen and chief agronomists must devote greater attention to millet. Only by doing so will they be able to obtain stable yields. The republic's Ministry of Agriculture must carry out those measures aimed at stimulating the production and procurements of millet, which were set forth in the recently adopted decree of the CC CPSU and the USSR Council of Ministers. In the process, it will be necessary to stimulate the production of marketable millet for food purposes and not for livestock feed, as is being done on some farms in Priural'nyy Rayon.

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BRIEFS

KAZAKH SSR GROAT CROPS--Work is increasing throughout the republic in light of the decree handed down by the CC CPSU and the USSR Council of Ministers entitled "Additional Measures for Stimulating the Production and Procurements of Grain of Buckwheat, Millet, Beans and Lentils." "Our efforts" stated V.N. Lushakov, chief agronomist for the Ministry of Agriculture of the Kazakh SSR "are being directed towards increasing the area under crops and raising the cropping power of the groat crops. There are farms in the republic where the buckwheat yields amount to five or less quintals per hectare. At the same time, leading farms are obtaining yields which are 2-3 times higher. The Kolkhoz imeni Zhdanov in Bol'shenarymskiy Rayon in Vostochno-Kazakhstanskaya Oblast annually obtains up to 15 quintals per hectare. Buckwheat will be sown here this year on approximately 1,000 hectares and its sowings throughout the oblast will be increased twofold. Millet will be grown on 700,000 hectares. The largest tracts will be located in Pavlodarskaya Oblast -- 184,000 hectares. A great amount of experience has been accumulated here in cultivating this crop. In Mayskiy Rayon alone, 37,000 hectares have been set aside for millet, with 20,000 involving the best predecessor crops -- perennial grasses and 12,000 -- following fallow. The sovkhozes Zhaltyrskiy, imeni Kirov and Sputnik are carrying out their sowing operations at a fine tempo and planting the seed in the soil in a high quality manner. The Kustanay workers must plant millet on 163,000 hectares and the Aktyubinsk workers -- 124,000. The sowing work has also commenced here. The Ural'sk workers must sow more than 100,000 hectares. Throughout the republic, 56 percent of the areas allocated for this crop have already been sown. A competition is unfolding under the slogans "The Badge of Quality for Each Field" and "Let Us Supply the Country With More Groat Crop Grain." [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 30 May 81 p1] 7026

BUCKWHEAT FIELDS EXPANDED--Tselinogradskaya Oblast--This year the oblast's farms are expanding considerably their sowings of a valuable groat crop -- buckwheat. The plans call for it to be sown on no less than 8,000 hectares. The best periods for sowing this crop are now at hand and the sowing units have transferred from the wheat fields for the purpose of sowing buckwheat. The greatest amount of such sowing is being carried out by the farms in Yermentauskiy Rayon -- 1,520 hectares And there is good reason for this. Experience has already been accumulated here in the cultivation of this crop. At the Yerkenshilikskiy Sovkhoz, for example, it is planted on 720 hectares annually. Fine yields are obtained here -- an average of 9-12 quintals. Last year the sovkhoz realized a profit of 76,248 rubles from its buckwheat sales. Nor is this taking into account the fact that beekeepers obtained 1.5 tons of excellent honey from an apiary located on buckwheat fields. [by I. Yavorovskiy] [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 28 May 81 p 2] 7026

FINE MILLET CONDITIONS--Pavlodar, 1 Jun--The oblast's millet growers have completed their sowing work. This valuable groat crop has been planted on 220,000 hectares -- 40,000 more hectares than planned earlier. The decision to increase the millet sowings was undertaken by the farmers in response to the decree of the CC CPSU and the USSR Council of Ministers entitled "Additional Measures for Stimulating the Production and Procurements of the Grain of Buckwheat, Millet, Beans and Lentils." In accordance with the task, the oblast's kolkhozes and sovkhozes must sell 70,000 tons of millet this year. During the last five-year plan, they surpassed this level twice. And this year, in their obligations, the labor collectives in Mayskiy, Lebyazhinskiy, Yermakovskiy and other millet growing rayons have called for considerable over-fulfillment of the plan for selling groat crop grain. The conditions required for this have been created. The millet sowings have been concentrated in rayons considered most advisable for their cultivation. This year, two thirds of the areas occupied by millet will involve use of the best predecessor arrangements for the crop -- following a bed of or furrow slice inversion of perennial grasses, or following clean fallow. On the majority of the farms, specialized teams are responsible for tending the millet crop. [by A. Kostyukov] [Text] [Moscow SEL'SKAYA ZHIZN' in Russian 2 Jun 81 p 1] 7026

INCREASED PRODUCTION REQUIRED--The Central Committee of the Communist Party of Kazakhstan and the Council of Ministers of the Kazakh SSR have taken note of the shortcomings which exist in connection with the production and procurements of the grain of buckwheat and millet and other groat crops. The Ministry of Procurements of the Kazakh SSR, the Ministry of Agriculture of the Kazakh SSR, the oblast and rayon committees of the Communist Party of Kazakhstan and the oblast and rayon executive committees in a number of oblasts and rayons are not exercising strong procurement discipline, nor are they displaying the proper degree of exactingness towards the farms with regard to their fulfillment of the plans for selling millet and buckwheat grain to the state. The Central Committee of the Communist Party of Kazakhstan and the Council of Ministers of the Kazakh SSR have adopted a decree on stimulating the production and procurements of groat crop grain. The Ministry of Agriculture for the Kazakh SSR, the Ministry of Procurements for the Kazakh SSR,, the oblast and rayon committees of the Communist Party of Kazakhstan and the oblast and rayon executive committees are obligated to conduct a review, in each oblast and rayon and at every sovkhoz and kolkhoz, of the reasons for the lag in the production of millet, buckwheat and pulse crop grain and to develop and implement a complex of measures for further raising the cropping power and gross yields of grain for these crops and for fulfilling the plans for selling the grain to the state. The CSA for the Kazakh SSR accounts for the buckwheat sowing areas and for the cropping power and gross grain yields from this crop as a separate line, with these indicators not being included in the average indicators for grain accounting by oblasts. When summarizing the results of the socialist competition, the state plans for grain procurements will be considered fulfilled only if the plan for state procurements of buckwheat and millet grain has been fulfilled and the farms have been fully supplied with seed for these crops. [Text] [Alma-Ata KAZAKHSTANSKAYA PRAVDA in Russian 25 Jun 81 p 3] 7026

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